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OBSERVATIONS
ON THE
DISEASES
WHICH PREVAIL IN
LONG VOYAGES
TO
HOT COUNTRIES,
PARTICULARLY ON THOSE
IN THE EAST INDIES;
AND ON THE SAME
DISEASES
AS THEY APPEAR
IN GREAT BRITAIN.

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THE

PREFACE.

THE first edition of the following work was published, in the year 1773, at the request of sir JOHN SILVESTER; who, at that time, presided over the medical concerns of the East-India Company. The materials, of which it was composed, were the result of experience and attentive observation; and it served to beguile the tediousness of many a vacant hour at sea, to collect and arrange them.

The favourable reception the work met with on its first appearance, and the frequent applications for another impression, for some years past, have induced the author to revise this edition with all the care and attention in his power, and to make such alterations and additions, as, he hopes, will render his labours still more acceptable.

The following edition is divided into three parts.

The first contains an account of the weather and diseases which occurred in two voyages to India; together with short topographical descriptions of the islands, and various places on the

continent of Asia, frequented by Europeans. This part being intended for the perusal of Gentlemen in general, minute descriptions of diseases are purposely avoided; it being only judged necessary to point out the prevailing epidemics, so far as they seemed to be influenced by situation, climate, changes of the seasons, and other circumstances.

In the second part, intended for the use of Medical Gentlemen only, the description of the prevailing diseases is minutely entered upon; and the methods of treatment, which were found most successful, placed in as clear a point of view as possible for the benefit of those, who are only entering upon the profession.

The opportunities the author has had of making observations, in different parts of the globe, convince him that diseases, in every climate, are respectively the same; and, when attended with danger or malignity, are only to be subdued by the same treatment. In this part of the work, therefore, he has availed himself of the advantages he has enjoyed for eighteen years past (in private practice, at the Dispensary, and at the Infirmary of Newcastle) of confirming the efficacy of the methods of treatment formerly proposed, and also, he hopes, of offering farther improvements.

The chapter on Fevers occupies a very considerable portion of this part of the work. The

subject, however, is important; and the author could not, in a smaller compass, give a full view of the practice he would wish to recommend.

Although the treatment proposed in the former edition of this work, and afterwards in a subsequent publication*, so far as it respects the early and liberal use of the bark, has not been generally adopted; yet several Physicians of great reputation have, in their writings, inculcated the propriety of a similar practice, which they had followed with success in different parts of the world. Among those the following hold the most distinguished rank—Dr. Millar † has found it to succeed in Great Britain; Dr. Sandiford ‡ in the island of Barbadoes; Dr. Sims § in Ireland; Dr. Lettsom || in London; Dr. Robertson ¶ in Africa, America, and Europe; and Dr. Balfour † in Bengal.

The dysentery, next to fevers, being the most fatal disease to Europeans in hot climates, is also treated at full length. And, should it resist the common method, the author has proposed the

* *Clark on Fevers.*

† *Diseases of Great Britain, published in 1770: And Diseases of the Army and Navy, 1783.*

‡ *Medical Obs. Vol. IV. 1771.* § *Epidemic Diseases, 1773.*

|| *Medical Memoirs, 1774.*

¶ *Physical Journal, 1777: Observations on the Ship Fever 1789: And an Essay on Fevers, 1790.*

† *Influence of the Moon in Fevers, 1785.*

trial of mercury, from which, in this country, he has experienced the best effects.

The other diseases are passed over in a more cursory manner. The author, however, has not omitted to mention any thing, which his experience has confirmed, relative to their cure: and in the tetanus, in which he has had few opportunities of making observations, he has introduced remarks from the most approved writers on the subject.

In the postscript to this part, he has given a report of the success of the practice in fevers, for fifteen years, on board the India ships; which, he flatters himself, will afford the most convincing evidence of the superiority of the treatment, which he proposed in the first edition.

To prevent the frequent repetition of prescriptions, recommended in this part of the work, they are numbered, and placed in the Appendix.—Thus, when the reader finds the powder, No. 5, directed, as at page 128; by turning to the *Formula Medicamentorum* in the Appendix, he will see the prescription opposite to No. V.—and so of any of the rest which may occur in any other page.

In the former edition, the prescriptions were translated into English for the benefit of those, who might not have it in their power to call in medical advice. But, the author being confirmed

in opinion, that, in the hands of the generality, prescriptions are often mistaken, and consequently do much harm, he has not done it in this impression. To Europeans entering on a distant voyage, when no Surgeon is on board, he would, therefore, recommend, that they should take a few prescriptions, compounded by their Apothecary, accompanied with such directions as may render their administration safe.

The third part of the work, like the first, is not limited to the medical profession alone; but is also intended for the use of officers on whom the prevention of diseases chiefly depends. For seamen and soldiers, so far as their health is concerned, can only be considered as adult children, who require authority to prevent them from doing themselves harm.

Although the dictates of humanity and the love of the service are sufficient inducements with British officers to attend to the health of their men; yet unfortunately they have, in general, considered it the province of the medical department alone. And many Surgeons must acknowledge how often they have had occasion to regret that they have been foiled in preventing the prevalence and mortality of diseases, not only by the obstinacy and prejudices of the men; but also, not unfrequently, by the inattention or neglect of their superiors.

To remedy these evils, the author has proposed, that *regulations of health* should be given to the officers, in every service, as *instructions*; and that they should be made *responsible* for carrying them into execution.

In this edition, at page 339, the author has proposed some important improvements of the Medical Journals of the East-India ships, which he humbly submits to the consideration of the DIRECTORS. The same attention should be paid to those in the Royal Navy; which, from the defective manner in which they have been kept, except in a few instances, have been of no public utility. But the author is persuaded, if in both services *instructions* be given to the commanders; if the *improvements of the Journals* be adopted; and if the *bark* be provided for the Royal Navy, that the prevention and cure of diseases will attain to greater perfection; that the health of seamen and soldiers will be preserved in times of public tranquillity; and that future wars will be carried on with an immense saving of lives and of treasure to the nation.

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N. B. The additional Chapters and Sections are marked with an asterisk*.

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PART I.

GENERAL OBSERVATIONS

ON THE

WEATHER AND DISEASES

IN LONG VOYAGES TO

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PART I.

GENERAL OBSERVATIONS

ON THE

WEATHER AND DISEASES

IN LONG VOYAGES TO

HOT COUNTRIES, &c.

CHAP. I.

GENERAL ACCOUNT OF THE WEATHER AND DISEASES IN A VOYAGE
FROM ENGLAND TO BENGAL, IN THE YEAR 1768, AND IN RETURNING
IN THE YEAR 1769.

THE Talbot Indiaman, Sir Charles Hudson, Bart, Commander, sailed from the Downs the 22d of March, 1768, and arrived at her moorings, in the river of Bengal, the 25th of August. There were embarked in all two hundred and forty men: one hundred and eight belonged to the ship; the rest were passengers and military recruits for India.

The month of March, till the 26th, was very cold and intemperate, with easterly winds: during the remainder of the month, the winds were westerly; and the weather still continued raw and uncomfortable, with fogs at night. Our passage down the Channel was favourable, and we soon arrived in more temperate latitudes, making the island of Madeira on the 6th of April.

* Rainy days, 1 ·, 16 · ·, 25 ·, 27, 28 ·, 30 · · ·.

March 23, lat. 49 deg. 18 min. N. 30 day, 43 deg. 37 min. N.

The complaints of this month consisted of catarrhal fevers, with hard coughs, and stitches in the sides. Some had sore throats: a few were afflicted with the rheumatism, and other diseases, the consequences of catching cold. These complaints were relieved by bleeding, antimonials, in small doses, diluent pectorals, opiates, and blisters; and totally disappeared with the warm weather. Two of the rheumatic cases were very obstinate; the symptoms continuing for many months, although a variety of medicines were tried. At last, the pains, which became fixed to the joints, were removed by rubbing mercurial ointment upon the parts affected†.

April, from the beginning till the 17th, was warm, dry, and temperate. The north-east trade wind‡ was favour-

* The quantity of rain is denoted by dots: slight showers or heavy falls of rain in proportion to the number of dots.

† See Chapter on the Rheumatism.

‡ The perpetual winds betwixt the tropics, which have got the name of trade-winds from their being so regular, and consequently so useful in navigation, seem to have a considerable influence upon the health of seamen. These winds cool and refresh the air, which otherwise would be insupportable. While they are steady, in every voyage, I have observed the seamen enjoy an uninterrupted state of health; but as soon as they cease, the air becomes hot and suffocating, and diseases more or less prevail.

Betwixt the tropics, where the heat of the sun is not only intense but constant, these winds observe great regularity, and are easterly all the year round; but on each side of the line they vary a little, and are north-east on the north side, and south-east on the south.

The trade-winds generally extend to the 28th degree of latitude, on either side of the line, but as they come near the equator disappear,

able and steady. From this to the end of the month, light winds and frequent calms prevailed: the weather became excessively sultry; but the heat of the vertical sun was, in a good measure, obstructed by a clouded sky.

Rainy days, 21 · ·, thunder and lightning, 23, 27 ·, squally.

April 1, in lat. 40 deg. 36 min. N. 10 day, lat. 25 deg. 52 min. N. 20 day, lat. 5 deg. 49 min. N. 30 day, lat. 2 deg. 41 min. N.

From the beginning to the 10th of May, the heat of the weather rather encreased, although the trade wind continued pretty brisk. From this till the 20th, pleasant breezes prevailed, with some intermediate days of calm; and as we daily encreased our latitude, and had frequent showers, the air became very temperate. To the end of the month we had fresh gales, cold, wet, and squally weather.

Rainy days, 5, 7, 9, 10 ·, 11 · · ·, 14, 17 ·, 18 · · ·, 20, 24, 25 ·, 26 · ·, 27, 29 ·, 30 · · ·.

May 10, lat. 17 deg. 24 min. S. 20 day, lat. 29 deg. 26 min. S. 20 day, 34 deg. 31 min. S.

Towards the latter end of last month and beginning of this, many of the ship's crew were seized with remittent fevers. The disease was generally ushered in with slight shivering, bitter taste in the mouth, head-ach, pain above the eye-brows; sickness, vomiting, and sometimes a purging of gall succeeded. The pulse at first was very quick, but soft, the countenance flushed, the skin very hot, and the thirst intense. The fever generally remitted, and in the most continued form, exacerbations were evident at night. When the patient did not neglect his case, the dis-

and variable winds and calms take place. What is said here is only to be understood of the open sea; for near the shores there are many circumstances which alter the regularity of these winds.

ease was easily cured ; however, three escaped with difficulty. The cure depended on cleansing the stomach and bowels, by small doses of tartar emetic*, which indeed often removed the fever in a few hours ; or, when it came to remit, it readily yielded to the bark. The disease did not require bleeding ; for in a few days it was accompanied with great prostration of strength and spirits. In such cases, the bark and wine were given freely, with the best effect, without paying regard to the remissions or exacerbations of fever.

In June, we were in the high latitudes, off the Cape of Good Hope, and found the weather cold and disagreeable, and the atmosphere hazy and moist. Towards the end of the month, the weather became more dry and temperate, with light breezes from the southward.

Rainy days, 1, 2, 3, 4, . . , 5, 6, 7, 8, 12 . . ., with thunder and hard squalls ; 13, 17 ., 18, 19 ., 22, 23, 24, 25 ..

June 1, lat. 34 deg. 35 min. S. 10 day, 35 deg. 33 min. S. 20 day, 32 deg. 9 min. S. 30 day, 23 deg. 19 min. S.

In the beginning of the month, the scurvy made its appearance ; only six or eight were affected. The symptoms proceeded to no great length, except in two of the soldiers. As the disease advanced, their ham-strings became affected ; they were subject to profuse hemorrhages from the nose and gums ; and one of them frequently fainted upon the least motion. They were plentifully supplied with wine, sugar, &c. and had the usual sea medicines : the disease, however, daily encreased ; and all which these remedies seemed to effect, was barely to keep the patients alive till we arrived at Madagascar. Besides this complaint, three of the soldiers laboured under a fever attended with a low sunk pulse, of which one died.

* Antimonium Tartarizatum.

Upon the first of July we anchored at St. Augustine's Bay, Madagascar. This large island extends from 12 to 26 degrees south latitude, and abounds with all sorts of refreshments. The climate is healthy; the air dry. The appearance of the country about the bay is unpromising; nothing presenting itself to the eye but craggy precipices, and a swampy valley beset with woods, and watered by a river which overflows each tide. A stranger, however, must not draw a picture of the island from this unfavourable confined spot; for, about a mile up the river, the ground is high and clear of woods. The country a little inland is extremely fertile, and affords a variety of agreeable landscapes, for which they are entirely indebted to nature, the male inhabitants making no improvements in husbandry, which is here the province of the females. But nature seems to produce every thing almost spontaneously. The vegetable productions are good, and in great abundance, such as rice, India corn, sugar-cane, sweet potatoes, melons, pumpkins, oranges, &c. In this island, there is a breed of very fine and large cattle. The mutton and fowls are good; and there are great variety and plenty of fish.

From April till November, the weather is dry, clear, calm, and sultry; but the heat of the climate is tempered by sea and land breezes, regularly succeeding one another. And such is the happy situation of this island, that on one side it enjoys the perpetual trade-winds; and on the other the monsoon. During the above period, Europeans enjoy good health at the bay; and, at that time, it ought to be preferred to every other place of refreshment, after passing the delightful settlements of the Cape of Good Hope.

The rainy season here commences about November,

and seldom continues longer than March ; during which time, the atmosphere is dark, gloomy, and boisterous ; and much rain falls. From the accounts of ships that have touched here during this period, we are told, that the climate is very unhealthy, and fatal to Europeans. The situation of the bay makes it evident that this must be the case at that place ; but as the villages of the natives, though at no great distance from the valley, are situated on high ground, they enjoy uninterrupted health all the year round. And, indeed, the hale vigorous constitution of the inhabitants, their long life, and total exemption from all chronic diseases, are sufficient evidences of the salubrity of the island.

Ships which are obliged, through stress of weather or sickness, to put in here, during the rainy season, should have their sick tent erected two miles up the river, near the village of the natives, where the land is high ; or the sick may be put daily ashore, at Tent Rock, opposite to the place where ships usually anchor, to take exercise, and have the benefit of the land air in the day-time, care being taken that they return to the ships before the evening dews happen, which, at this period, are very considerable. Thus the bad effects of nocturnal air, so productive of diseases, in many situations, in hot climates, will be prevented. However, no such precautions are necessary in the dry season.

We sailed from St. Augustine's Bay the 11th of July : till the 17th, the weather was calm, the air moist and suffocating ; and from that till the end of the month, we had pleasant gales, hazy, and very sultry weather.

Rainy, 16 ; 17 ; 18 ; 25, 26 ; 27.

July 1, lat. 23 deg. 26 min. S. 20 day, 10 deg. 4 min. S. 25 day, 49 min. S. 30 day, 8 deg. 14 min. N.

Towards the end of the month, a fever of a very bad kind made its appearance, attended with delirium, low pulse, petechiæ, livid vibices, and hemorrhage from the nose, of which one died; and three or four more escaped with difficulty. It is proper to observe, that the symptoms denoting a tendency to putrefaction only ran high in those who had such an antipathy to the bark, that they could not be prevailed upon to continue the use of it; whereas those who took this medicine, and used it liberally, very soon got free of the fever. As the patients, when taken ill, were removed from the rest, and other means of prevention observed, the infection did not become general.

August, from the beginning to the 25th, was sultry, hazy, and wet, with strong north-westerly winds. On the 25th, we anchored at Culpee, in the river of Bengal. From the 25th to the end of the month, the weather was very unsettled, with much thunder and lightning, accompanied with torrents of rain.

Rainy days, 8, 12, 13 . . , thunder and lightning; 15 . . . , thunder and lightning; 16, 19, 21 . . . , thunder and lightning; 25, 26, 27, 28, 29, 30, 31 , thunder and lightning.

August 10, lat. 5 deg. 48 min. N. 19 day, 21 deg. 18 min. N.

In the two first weeks of August, many of our people, officers, passengers, as well as the common seamen, were attacked with sickness, often a vomiting, but always a purging of gall, accompanied with fixed or flying pains in the bowels. For the first and second days, the stools were large and bilious; but in all it terminated in gripes and fruitless straining. In two or three, the disease made its appearance with all the symptoms of a bilious colic;

and in one it began as a cholera. All these bilious complaints, whether we give them the names of diarrhœa, cholera, or dry belly-ach, when neglected, had an equal tendency to terminate in the dysentery: but when proper remedies were applied at first, the diseases were easily removed. The particular treatment I shall refer to another place, only I must remark, that there is a very great analogy amongst all these diseases; and that those who suffered most by these complaints were more liable to remittent fevers and dysenteries in the following months.

I shall now proceed to give a general account of the weather and the diseases that occurred during the months that we staid at Bengal, leaving the description of the country, as far as it seemed to influence these diseases, to another place.

The first two weeks of September were intolerably hot, sultry, and suffocating, with fogs and dews at nights. On the 16th and 17th, it blew fresh from the east. During the remainder of the month, the weather continued as intemperately hot as ever, with few or no intermediate breezes.

Rainy days, 4, 6 · ·, 8, 9, 21, 22 · ·, with thunder, lightning, and hard squalls.

The month of October was more insupportably sultry, and scarcely a breath of air was observable till the 28th; when refreshing breezes rendered the weather more cool and temperate for the remainder of the month.

Rainy days, 2, 6, 7, 8 ·, 10 · · ·.

During these unhealthy months, fevers and fluxes of a very dangerous nature, were very prevalent at Culpee, and carried off numbers of seamen belonging to the ships lying there. At last they became so general, that, by the end of September, there were few or no hands on board

of our ship capable of doing duty. They likewise raged at Calcutta, and were particularly fatal to those who had lately arrived.

The first weeks of November were calm and sultry in the middle of the day; but the air was refreshed by pleasant breezes, frequently in the forenoon, and always in the afternoon. From the 16th to the end of the month, the weather was serene, pleasant, and temperate.

No rain; wind northerly.

In the beginning of December, the weather was agreeable, and the winds westerly. On the 9th, the wind shifted to the south. From this till the 14th, it was remarkably close and calm in the day-time; and there were thick fogs and heavy dews at nights. The rest of the month the winds were northerly, and the weather delightful, as it usually is here at this season of the year.

No rain.

About the 10th of the month, several of the seamen were afflicted with diarrhœas, which I shall call colliquative, as they were accompanied with very copious thin stools, without pain, gripes, or tenesmus. In twenty-four hours, they reduced the patient to the greatest degree of weakness, and soon made the countenance look pale and ghastly. The principal remedies employed were very gentle emetics; magnesia and rhubarb; with opium, to restrain the profuse discharge; and chicken-broth and wine, to support the strength of the patient; and, in many cases, the bark, at first in cold infusion, and afterwards in substance, was indispensably necessary to strengthen the relaxed bowels.

January, 1769, was a pleasant, healthy, and temperate month. Our people suffered no inconvenience from the climate. Two or three were in the convalescent state of

the flux ; one laboured under the hepatitis, or disease of the liver ; and two had other abdominal obstructions, the consequence of frequent attacks of the diseases of the former months.

Rainy day, 1 . Winds for the most part northerly.

February was also serene, dry, and temperate, with agreeable breezes, except in the middle of the day, when the air was calm and sultry for a few hours. But, at this time, as also in the two preceding months, the climate is so healthy, that exposition to the sun and exercise, which before produce often instant sickness, were attended with no danger, as the sky was generally clouded ; the marshy grounds dry ; and the air free from noxious exhalations.

Rainy days, 5, 25, 26 . . . ; with much thunder and lightning, and strong north-westerly winds.

The beginning of March was also temperate. About the 11th, the weather became close and sultry, and continued so till the 22d, unless when hard squalls happened, which were accompanied with thunder, lightning, and great falls of rain. As we were at sea, during the remainder of the month, the weather, though warm, was very agreeable.

Rainy days, 11, thunder and lightning ; 12 . ., 14, 19 . . ., with much thunder and lightning.

We sailed for England the 22d of March. At this time almost all our people were able to do duty ; however, several of them, who had suffered much in the sickly season, had not regained their usual strength and vigour. After the delightful months already described, this may, at first sight, seem extraordinary ; but when it is considered on what poor diet seamen are obliged to live, at Bengal, their slow recovery from diseases will be easily

accounted for. The animal food consists of lean beef, affording little nourishment; and pork, which makes a considerable part of their diet, is very bad. Greens and other fresh vegetables are neither to be procured in such plenty, nor at such a moderate rate, as to become articles of the ship's provision. The only vegetables which seamen are allowed in abundance are yams and rice.

During the two last months we remained at Bengal, about twenty of our people had the venereal disease, which they contracted at Culpee. The infection, for the most part, made its appearance in the form of ulcers; warts and rasberry-like excrescences on the penis. Amongst the number infected, only two had a virulent gonorrhœa. The disease, though local, was only to be cured by mercury; however, several cases resisted its power, as a very inconsiderable quantity of the specific, whether exhibited internally, or applied externally, ran to the mouth, and was speedily carried off by salivation: so great was the relaxation occasioned by the heat of the climate, and so poor and dissolved was the state of the blood, long after the destructive diseases of the sickly season*.

The first week of April was calm and sultry. From that to the 23d, there were light winds, with frequent calms, and very hot weather. The remainder of the month was more temperate, with refreshing breezes.

Rainy day, 29 . .

April 1, lat. 13 deg. 41 min. N. 10 day, 11 deg. N. 20 day, 7 deg. 47 min. N. 30 day, 5 deg. 44 min. N.

In April, five of our people had remitting fevers. In one of the patients the disease was accompanied with symptoms of putrefaction, great prostration of strength,

* See Chapter on the Venereal Disease.

hemorrhage from the nose, and a delirium, with a low sunk pulse. Although bark and wine were given freely, yet his fever continued for about three weeks.

The month of May, though very warm and sultry, was healthy. In the first week, being under the equator, we were becalmed, but the heat of the sun was obstructed by a clouded sky; and the air refreshed by agreeable showers. During the rest of the month, as the trade-wind became steady, and we daily increased our distance from the sun, the weather was more temperate.

Rainy days, 1 · ·, 2, 3, 4, 5, 6 ·, with lightning; 11, 12, 14, 18, 19, 22 · ·, 27, 29, 31 ·.

May 28, 11 deg. 32 min. S. 30 day, 22 deg. 5 min. S.

June, from the beginning to the 7th, was temperate and cool, and the winds favourable. From this to the end of the month, for the most part, it blew fresh from the north-west, and the weather was cold, wet, and stormy.

June 18, lat. 30 deg. 20 min. S. 20 day, 32 deg. 4 min. S.

Rainy days, 1, 2, 7, 8, 9 · · ·, 10, 11, 13, 15, 17, 20, 22, 27 · ·, with much lightning.

July was very cold and stormy. From the beginning to the 5th, it blew hard, with frequent squalls. From this till the 20th, the weather was very uncomfortable and stormy, one violent hard gale continually succeeding another. The high seas and contrary winds obliged us, for the most part, to lie to; and, as the ship became leaky, both from the water getting in betwixt her planks, and from the waves and large seas breaking over the decks, it was necessary to keep the pumps almost constantly at work. From the 20th to the end of the month, the weather was variable and unsettled.

Rainy days, 3, 4, 5 . . , with hail, 9, 10 . . . , with thunder and lightning ; 12 , with hail, thunder and lightning ; 13, 14, 15, thunder and lightning ; 18, continual rain, hail, thunder and lightning ; 19 , thunder and lightning ; 20, 21, 22, 24, 26, 27 .

July 1, lat. 35 deg. 45 min. S. 6 day, 36 deg. 36 min. S. 10 day, 37 deg. 24 min. S. 20 day, 34 deg. 51 min. S. 30 day, 23 deg. 55 min. S.

In the beginning of June, two of our people began to be affected with the scurvy : the continuance of the cold moist weather, the nastiness of the decks, the corruption of the common diet, the biscuit as well as salted provisions, all contributed to make its progress very rapid. On the 18th of July, twenty of the seamen were rendered incapable of all duty, and some of them reduced to the last dreadful stage of this distemper. And many of those also who still kept the deck, were more or less affected with it. Although the officers, who lived better, and lay in drier apartments, were not totally exempt from the disease ; yet the symptoms ran to no great height in any of them, except in one who was greatly weakened by an antecedent fever.

The unfavourable weather still continuing, on the 19th of July, it was unanimously agreed to bear away for Madagascar, as being the nearest and best port for refreshment, and the only-means of preserving the lives of our seamen ; and of course the ship and cargo, which now seemed to be in imminent danger. We arrived there on the first of August, and anchored in St. Augustine Bay.

During our run to that place, the scurvy increased daily ; the symptoms grew worse ; and greater numbers were affected. Of the ship's company, which, at our leaving Bengal, consisted of no more than eighty-seven, officers

and boys included, thirty-three of the best hands were confined below, many of them in the last stage of the disease; and those who still continued upon deck were so much enfeebled; that the duty of the ship required the assistance of the passengers and their servants.

We lay at Madagascar all the month of August, during which time the weather was settled, the air dry, and the heat of the sun pretty intense in the day-time; but at nights it was chilly and cold, owing to fresh sea-breezes blowing from the afternoon till midnight.

As soon as we arrived at this plentiful island, the sick were supplied with oranges in abundance, and vegetable soups, thickened with greens and pumpkins. It was, however, judged prudent, that the weakest of them should be kept on board for a few days before they were sent to the sick tent. By this precaution, and the free use of wine allowed by our commander through the course of the disease, we had the good fortune to lose none of our people. By the 20th of the month, they were all capable of duty except four; three of whom had still monstrous swelled legs and contracted ham-strings; the countenance of the other patient was bloated, and he was subject to profuse hemorrhages from the nose.

On the 7th of September, we sailed from St. Augustine's Bay. As we approached the high latitudes off the Cape of Good Hope, the weather was again cold, wet, and uncomfortable.

Rainy days, 5 . . . , 15, 16. 17, 21, 22, 23 . . ; 25, 28, 30 ., with lightning.

September 18, lat. 24 deg. S. 20 day, 33 deg. 56 min. S. 30 day, 35 deg. 36 min. S.

The first week of October was cool, dry, and temperate. From this to the end of the month, the weather was warm

and serene, the heat of the sun being tempered by refreshing breezes.

Rainy day, 1°.

October 10, lat. 24 deg. 4 min. S. 30 day, 14 deg. 31 min. S.

On the 17th of this month, we anchored at the island of St. Helena, and set out to sea again on the 29th.

This island, which, at a little distance, exhibits the appearance of a stupendous rock, is situated in the middle of an immense ocean, and in a tract where the south-east trade-wind seldom intermits. The climate is therefore serene, temperate, and pleasant; and, through the whole year, is neither subject to the extremes of heat nor cold. This island appears very barren at first sight; but, upon entering into the country, the eye is transported with scenes and landscapes, romantic beyond description; consisting of good pastures, verdant vales, and high irregular precipices. The soil in the vallies is rich and deep, and would produce all kinds of grain, roots, and greens, were it not for an amazing number of rats and mice, which devour the seed as soon as thrown into the ground. A species of yam grows here in great plenty, which is sliced and boiled for a long time, and afterwards toasted; before it is thus prepared, the juice of this root is said to be of a poisonous nature: but, after it is dressed, not only the slaves, but even the best families, eat it as bread, to which they prefer it, although they have flour and corn sent annually from England in the storeships.

The families generally reside in the country; but, as soon as a ship arrives, they repair to St. James's valley, where most of them take in lodgers, who meet with excellent refreshments; and are regaled with abundance of animal and vegetable food, and some fruits, the produce

of their farms. If one might judge from the variety of roots, such as carrots, turnips, potatoes, and greens, which are served up daily at their entertainments, he would naturally conclude, that, with a little pains, a sufficient quantity of this salutary part of diet might be raised, not only to supply the soldiers who reside here, but even a whole scorbutic fleet.

Although the gentlemen, who can afford to live on shore, meet with such proper refreshments, after a long sea-voyage, yet this is not the case of the common sailors; for, unless half rotten with the scurvy, and sent ashore upon sick quarters, no other vegetable can be procured for them, but at an exorbitant charge, except purslain, which is gathered by the boys from the rocks, and of which they have a scanty allowance in their soup. The want of proper refreshments at this island may be considered as the only cause why seamen are so often afflicted with the scurvy in the short passage to England; nor can any other reason be assigned why the soldiers, who reside on this salutary island, are subject to the same disease.

This scarcity of vegetables, in my opinion, might easily be remedied, by setting apart a sufficient quantity of the company's land, for the cultivation of fruit, greens, and roots: for certainly, with the same care and industry, these lands would produce as good pot-herbs, turnips, carrots, potatoes, and pumpkins, as any of the farms of the planters; who only raise a sufficient quantity for themselves and guests.

If such a humane scheme as this were adopted, St. Helena would be inferior to no place in the world for refreshments. Vegetables would be produced in abundance, not only to supply the garrison; but would be

procured at a rate sufficiently moderate to become an article of every ship's allowance while at this island.

During the first week of November, the weather was pleasant, and the south-east trade steady. From the 18th till the 20th, being near the equator, the weather was sultry and rainy; and the winds variable, with frequent calms. Till the end of the month, there was a fresh north-east trade, with agreeable temperate weather.

Rainy days, 12, 13, 15, 16, 17, 18, 19, 20, 29 . . .

November 1, lat. 11 deg. 50 min. S. 10 day, 2 deg. 25 min. N. 20 day, 8 deg. 46 min. N. 30 day, 21 deg. 27 min. N.

This month several of our people were attacked with fevers, which only seemed to be symptomatic from bile, as the disease soon disappeared by cleansing the bowels. In two cases, however, the disease was accompanied with symptoms of putrefaction, and the fever run out to the 12th or 13th day.

During the first ten days of December, the weather was delightful and temperate, and continued so till near the 20th, with some intermediate days of calm. From this to the end of the month, it was cloudy, hazy, and cold.

Towards the end of the month, three of our people were confined below by the scurvy, attended with the usual symptoms; and many of those, who were cured at Madagascar, seemed to have a tendency to relapse.

Rainy, 2, 8, 11, 14, 17, 18, 19, 21, 22, 23, 27, 29 .

December 10, lat. 26 deg. 46 min. N. 20 day, 36 deg. 31 min. N. 31 day, 49 deg. N.

January, 1770, was a cold disagreeable month; the winds were north-easterly, accompanied with snow and

sleet. On the 21st, the wind shifted to the westward, and the weather became more temperate.

On the 5th, at night, we made Scilly, but, by contrary winds, were detained in the channel. On the 16th, we arrived in the Downs, which put an end to our tedious and disagreeable voyage.

The diseases of our seamen this month were coughs and colds; four had ulcerated sore throats; some were afflicted with the rheumatism; and two had swelled testicles, independent of any venereal taint.

The treatment of these cases did not differ from the common practice: only it is to be remarked, that it was unnecessary to make copious evacuations; and, even when blood was drawn for a peripneumonic symptom, a few ounces, though it gave relief, greatly enfeebled the patient.

I shall conclude this chapter with observing, that of the number of people, who went out in the *Talbot*, thirteen died: viz. two of the recruits in the outward passage; five of the ship's company at *Culpee*; three at the hospital in *Calcutta*; and three in the homeward passage; of whose cases a more particular account will be given afterwards.*

* See Part II. Chap. IV.

CHAP. II.

A GENERAL ACCOUNT OF THE WEATHER AND DISEASES IN A VOYAGE TO MADRAS AND CHINA, IN 1771, AND IN RETURNING TO ENGLAND IN 1772.

THE Talbot sailed from the Downs on the 16th of Feb. 1771. The ship's company consisted of one hundred and seven men. There were also on board sixteen passengers, and seventy military recruits for the establishment at Madras.

In the first week of February the temperature of the air, was moderate for the season. From the 8th to the 11th it was intensely cold; and much snow fell. To the end of the month, the weather * was cold, and unsettled.

The diseases of this month consisted of colds, which, in some cases, continued obstinate, till such time as we got into warm weather. A few of the seamen and soldiers had inflammatory sore throats; and four were seized with a continued fever of a low kind, which yielded to the liberal use of the Peruvian bark.

Many of the seamen and soldiers also had the venereal disease; but as some hints, respecting its treatment, in hot climates, will be offered in the second part of this work, I shall take no farther notice of this distemper, in this short historical sketch.

In the beginning of March, the weather was still cold, and variable. From the 11th to the 15th, light airs, or calms prevailed. On the 15th we got into the north-east

* For the course of the winds; the rainy days; the exact heat of the air; and the latitudes; the reader is referred to the next chapter, containing, a meteorological register kept during the voyage.

trade-wind : and from this time till the 27th, the air was agreeably warm and dry ; and the sky clouded. To the end of the month, being near the equator, the weather was moist, and extremely sultry.

On the second of this month, a black boy, a native of India, died of a consumption. When we sailed, he was reduced to that stage of the disease, from which none recover.

On the 14th of this month, one seaman, and on the 16th another, was seized with the remittent fever. They were both placed in airy situations ; and, after evacuating the bowels, they speedily recovered by the use of the bark.

On the 29th of the month, the chief mate, after being exposed to the rays of the sun, was seized with the remittent fever ; and was also successfully treated in the same manner.

One of the midshipmen was taken ill of the dysentery, and one seaman was attacked with the bilious cholic : they were treated agreeably to the plan to be afterwards mentioned in these diseases, and recovered.

Several of the crew, about the end of this month, complained of head-ach, faintness, and oppression at stomach ; sometimes without any symptom of fever ; and sometimes with considerable quickness of pulse. When there was no great heat, a dose of salts, or of crystals of tartar was sufficient to carry off the complaint. But when the person was feverish, emetic tartar, managed so as to occasion some degree of puking, and afterwards to evacuate the intestines, seldom failed to remove every symptom.

Both in this, and in the former voyage, as we approached the equator, most of our people complained of a cutaneous eruption, called the *prickly heat*. It con-

sists of numerous pimples, or red spots, breaking out in various parts of the body, occasioning an intolerable itching. Interspersed with this eruption, especially upon the hands, small eminences, white tubercles, or weals, frequently appear, resembling the sting of nettles, which greatly add to the itching, and are increased by scratching.

The *prickly heat* is not accompanied with any febrile commotion ; and is accounted salutary. When severe, it is mitigated by a cool, and spare diet, and gentle laxatives. But whilst it continues out, no inconvenience arises except the itching ; and, after a few weeks, it either disappears, or ceases to give much trouble. The retrocession of this rash is always attended with head-ach, lassitude, and often a feverish state. Therefore sudden exposition to a current of air, when sweating, and the use of the cold bath, ought to be avoided.

April, from the beginning to the 4th, was close and sultry, with dews at night. From this to the 23d, we had an agreeable south-east trade-wind, though the weather still continued very hot and dry. To the end of the month light airs, with some intermediate days of calm. On the 29th, at eleven o'clock at night, the moon was eclipsed for two hours ; during which, the air felt remarkably chilly ; although the thermometer did not sink under 72°.

Eight of our people this month laboured under the remittent fever : In three it was slight ; but, in the remaining five, so severe as to require the liberal use of the bark.

Having perused the *Thesis* of the ingenious Dr. James Lind on the remittent fever of Bengal, which gives an account of the sudden, and violent effects of an eclipse of

the moon,* on eight convalescents at Calcutta, I narrowly watched its influence on these five patients, three of whom were still in a weak state. But it had no apparent effect on any of them. One, indeed, relapsed on the first of May; but he had been employed, at hard labour, in the gun-room, on the morning of the day, on which his fever recurred,

Three other patients were this month on the sick list: one had the dysentery; one gravel; and one hemorrhage of the nose.

The month of May to the 20th was temperate. From this to the 26th the air felt colder and more chill than the thermometer denoted. To the end of the month the weather was unsettled, squally, and rainy.

One of our people had a slight remittent which yielded to an emetic; and two laxatives: But other two had low fevers, with remissions, which required the bark, wine, and the moderate use of opium. Although we were off the Cape of Good Hope, none of the crew had the least appearance of scurvy.

June, from the beginning to the 5th, was squally, and rainy with some thunder and lightning. From this to the 17th the weather was exceedingly pleasant. To the end of the month the air was extremely sultry, especially at Johanna, as will appear in the meteorological register.

* Subitos ac violentos lunae effectus tum praecipue observavimus 4to. nonas Novembris, hora circiter secunda matutina; quo tempore, terra interposita, radios solares intercepti: in eo temporis articulo haud pauciores octo nantarum ex nave *Drake*, qui, ad Calcuttam in aedibus praefecti navis, ex febribus convalescebant; eodem fere temporis puncto vehementissimo paroxysmo sunt correpti: etidem plurimis evenit, qui in nave fuere collegae nostri curae demandati.

Dissertatio Medica de febre remittente, &c.

In the beginning of this month, eight people had the remittent fever ; which, in three cases, was so severe as to require the liberal use of the bark.

On the 19th of June we anchored at Johanna, the chief of the Comera islands ; and sailed from it on the 22d, all in perfect health.

This island, which, at a little distance, affords the most delightful landseape, is situated almost at an equal distance from the north-east end of Madagascar, and the eastern coast of Africa. The land appears remarkably elevated ; in many places towering up into high peaks. The level ground, near the place where we anchored, is of inconsiderable extent ; and thickly covered with cocoa trees and shrubs. Some of our officers, and passengers, who went up into the country, complained much of the intense heat they experienced in ascending the mountains, and of a transition to chilness as they approached the summits.

The harbour being very accessible ; and the business of taking in wood and water expeditious ; most of the outward bound ships touch at this island. The refreshments are also good ; and are to be procured at a moderate rate. The bullocks, and fowls, though small, are good. The oranges are excellent. There are also some pine apple : limes, guavas, pumpkins, and plantains, are to be procured in abundance.

The air of this island does not appear to be very salutary : for, during our stay, the high mountains were covered with a thick fog. But as we were there during the dry season, and as those who staid ashore on the duty of cutting wood, either slept in suspended cots, or had temporary beds, considerably raised from the ground, none suffered from the effects of nocturnal exhalations.

We had, indeed, some cases of fevers on board on the following month ; but as they were mild, in every instance, except two, I can ascribe their origin to no other cause, than what frequently produces them on the ocean.

But in order to guard the unwary voyager, against the destructive influence of sleeping ashore, on the Comera Islands, I shall introduce the melancholy catastrophe which happened to the Ponsborne, and Nottingham, East Indiamen.*

The Ponsborne, on the 25th of August 1765, anchored to the leeward of the Island of Mohilla, which is at no great distance from Johanna. The sick were immediately sent ashore, consisting of about fifty, ill of the scurvy, who recovered in a few days. The ship sailed on the second of September ; but was becalmed to the 5th : upon which day, above forty of the crew were attacked with the remittent fever ; chiefly consisting of those who had been ashore for the cure of the scurvy. The Carpenter's, Cooper's, and Boat's crew, who, from their employment, had slept ashore, during the stay of the ship, were also seized with this fever, most of whom died : and, in a few weeks, above seventy people were carried off by this pestilential distemper.

The Nottingham Indiaman, anchored to the leeward of Johanna, 16th of July 1766. Forty of the sick, chiefly ill of the scurvy, were sent on shore. The Carpenters, Coopers, and several others, likewise slept on shore. On the 21st of July the ship sailed, but was becalmed in sight of the island. From the beginning of August to the 10th, most of those, who slept on shore, were attacked with a remittent fever of a bad sort. Of nine people who

* See Medical Observations and Inquiries, Vol. IV. 1772.

slept in a tent, chiefly officers, seven were seized with the fever, of whom two died. The other two escaped : the one by sleeping in a sea cot, well protected from the air ; and the other by being almost constantly intoxicated.*

The month of July, for the first week, was remarkably close and moist. To the 25th the air was very sultry, sometimes with light winds, and sometimes with calms. On the 25th we anchored in Madras roads. From this to the end of the month, the heat was intense ; and would indeed have been insupportable, had not the sea and land breezes regularly succeeded each other.

Six on board were afflicted in the beginning of this month, with the remittent fever ; which, only, in one of the passengers, was attended with dangerous symptoms.

From the beginning to the 12th of August, the weather was extremely sultry, with thunder and lightning and some rain. From this to the 23d, the same hot weather continued, with frequent squalls of sand and dust from the shore, often succeeded by heavy showers of rain. But the sea breeze blew regularly in the afternoon ; and continued till ten at night, which made the air comparatively cool and agreeable. On the 23d we sailed from Madras ; and notwithstanding the thermometer ranged high, during the remainder of the month, having a brisk

* The air of Johanna proved equally fatal to the military regiments intended for the reduction of the Cape of Good Hope in 1781 : but who afterwards, in their voyage to India, touched at this island. By encamping, and sleeping ashore, the remittent fever was caught, and afterwards spread by contagion ; and many lives were lost. Six officers of the 100th regiment died, and the 98th and other regiments, particularly the 2d battalion of the 42d suffered equally, if not more, in proportion. See *Remarks on the causes which produce diseases, amongst new raised troops in long voyages.*

favourable wind, and a fine grey sky, the air felt temperate and invigorating.

Upon our arrival at Madras, the ship's company were employed at hard work, in unloading the vessel, not only in the morning, but during the hottest part of the day. On the second day after our arrival, ten of our people were seized with bilious complaints; which, in a fortnight, went through above one third of the crew; and raged as generally amongst the other ships lying at anchor in the roads.

These complaints were ushered in with sickness, vomiting, and often a purging of bile. In some the evacuations were large and copious, without gripes: others were tormented with excruciating pains in the bowels, accompanied with fruitless straining and tenesmus. Some were seized with every symptom of the dry belly-ach; and others had a true cholera morbus.

In all these ways, this assemblage of bilious complaints began; and some who exposed themselves, when hot, to the dry land winds, along with the symptoms already enumerated, were afflicted with general soreness, weariness, and severe spasmodic affections of the muscles. The treatment of these complaints shall be reserved to the second part of this work.

Whilst we staid at Madras, one of the seamen was seized with apoplexy from a *coup de soleil*, of which he died. As strokes of the sun,* especially when persons are

* In the Carnatic, apoplexies from this cause, Mr. Dick, who attended a regiment of artillery for two years, observes, proved more fatal in the last war, than the cholera morbus, dysentery, and inflammation of the liver. The men were generally seized, when fatigued by marching in the heat of the sun. "They complain first of great head-ach,

fatigued, or intoxicated, are frequent causes of death in hot climates, I shall here introduce his case; and afterwards some remarks on the probable means of averting the danger in similar attacks.

EDWARD HILLIAR, a young man of a strong, active, and healthy constitution, was allowed to go on shore on pleasure, and to remain at Madras on the 17th and 18th days of August, when the thermometer was at 94° and 93° at mid-day, at sea where the ship anchored; and consequently would have stood some degrees higher ashore. On the forenoon of the 19th, he assisted in putting a bale of cotton on board a boat; and, as soon as the boat was put off, he lay down without making any complaint, except having a motion to puke. His companions imagining him to be asleep, took no notice of him till the boat came along side of the ship; when one of his messmates endeavoured to rouse him, but in vain.

My assistant was called to visit him, but half an hour having elapsed from his laying down in the boat, no motion was to be felt in the thorax, nor any pulsation in the arteries. His countenance was of a deep purple colour; his face and neck swollen; and the jugulars very turgid. His jaws were locked; his eyes dead, and staring; and

head-ach, thirst, and sometimes difficult breathing; in a few minutes, a vertigo and bilious vomiting come on. They drop down breathless, turn commatose; and, unless immediate assistance be given, the face swells, and turns almost black; the pulse which was at first full and quick sinks; and after some hard struggles for breath they expire."

"Removing them under the shade of a tree, bleeding them freely in time, and giving them some water, generally cure them; but as the stomach and bowels are often loaded with bilious matter, it is necessary in the evening to give them small doses of tartar emetic, in a saline mixture, which answers better than any other evacuant." Medical Commentaries for 1785, Vol. X.

his fists strongly clenched. The heat of his body was much above the standard of health, and communicated a burning pungency to the touch. He was bled largely both from the arm and jugular: the blood was very hot, and it was with the greatest difficulty stopped. Various other means were tried; but nothing was done to diminish animal heat.

Two hours had elapsed before I came on board; the joints still remained flexible; but the glassy appearance of the eyes, and the inflation of the bowels, evinced that life had totally deserted the body.

This unfortunate case made a strong impression on my mind: for although some vessel of the brain might have been ruptured, so as to have rendered every effort unavailing; yet, in such casualties, besides bleeding, I should place the greatest dependence, upon the instantaneous application of such means as would reduce the animal heat, at least to the standard of health; and are calculated to take off the rarefaction of the blood in the vessels. With this view, therefore, the body should be shaded from the rays of the sun; the air made cool by fanning it near the unfortunate object; and water, rendered artificially cold, should be freely applied to the head, face, and neck; nay even to the whole body; and also injected into the intestines: and when by these means, the body is sufficiently cooled, an attempt should be made to restore respiration by inflating the lungs.

From the 1st to the 5th of September, the weather was thick, hazy, calm, and excessively hot. The nights were damp, and the air below so disagreeable, that the people often slept upon deck. To the 10th the weather was generally calm, and rain poured down in torrents, with much thunder and lightning. On the 20th and 24th we had

a pleasant gale ; but the rest of the month was moist, and disagreeably hot, with much rain, thunder, and lightning.

Several circumstances contributed to make this a very unhealthy month: the ship being much lumbered when we sailed from Madras, the seamen were kept in constant duty, in stowing goods: and there was no opportunity of airing the hammocks, or keeping the decks clean. We were likewise exposed to noxious exhalations from the shores of Sumatra; and other Islands in the Straits of Malacca.

By the middle of the month, twenty four patients were on the sick list, afflicted with the remittent fever, and dysentery; attended with great prostration of strength: and many of the seamen, who still continued to do duty, like plants in an unhealthy soil, drooped, looked pale, wan, and sickly.

On the 20th of September, the ports were laid open; the chests and hammocks carried upon deck; and the ship underwent a thorough purification. By these means, and getting out of the reach of the exhalations from Sumatra, a check was given to the fever and dysentery; but we had the misfortune of losing the Carpenter's mate*, who relapsed into the remittent fever, and died on the 23rd of this month.

October, from the beginning to the 10th, was close, sultry, and hazy, with some rain. To the 25th the weather was pleasant, and dry, the heat of the air being tempered by a clouded sky, and fresh breezes. From this to the end of the month it was sultry in the day; but cold and chill at night.

On the 19th of October we got up the Tigris as far as Macao and on the 25th anchored at the Wampoa; where

* See Robert English's case, among the collection of remittent fevers.

our people all arrived in tolerable health; and being supplied with nourishing diet, even the weakest recovered in a few days.

I shall now proceed to give a short detail of the state of the air, and diseases, which occurred at Wampoa, leaving the description of the country, soil, and situation to another place*.

In the month of November, the weather was still sultry in the middle of the day. But the nights and mornings were cold, moist, and chilly, owing to the northerly or easterly winds blowing over the swampy rice grounds.

From the beginning of December to the 20th, the weather was very agreeable and temperate in the day; but frequently exceedingly chill at nights. From the 20th to the 23d, the atmosphere was gloomy and cold. To the end of the month, the winds were northerly; the air cool in the day time; but at nights very chill and moist.

The constitution of the air, in the two last months, was very productive of diseases. Above one third of our people were attacked with remittent and intermittent fevers, and the dysentery. The fever and flux were frequently combined; and often changed into one another. The flux, however, was the prevailing disease, and in most cases, soon after the invasion, when treated properly, the febrile symptoms disappeared.

In the first five days of January 1772 the wind being southerly, the air was agreeable, dry, and temperate. To the end of the month, the winds were N. E. and the weather very cold and chilly.

This month our people were in general healthy; and those who had the flux were recovering. This disease

* See Part I. Chap. IV. Sect. III.

however, was still prevalent amongst the crews of other ships lying at Wampona.

The first week of February the weather was cold. From the 7th to the 13th, the winds were generally southerly, and the air temperate. To the 19th, the winds were northerly, and the weather cold. From this to the end of the month, the air was agreeably temperate.

Towards the end of last month, and beginning of this, colds, with slight pleurisies, were the prevailing complaints, which required once bleeding. One of our people died of the locked jaw, whose case will afterwards appear in the chapter on *Tetanus*.

March from the 1st to 5th was warm and sultry in the day. On the 5th and 6th the winds were northerly, and the atmosphere cold and gloomy. On the 7th we sailed for England; and had agreeable temperate weather to the 15th. From this to the end of the month, especially when we crossed the equator, and arrived at the straits of Banca, the air became excessively sultry.

From the beginning of April to the 8th the air was hot and sultry. To the end of the month, as we daily increased our southern latitude, the weather was generally pleasant and temperate; although the thermometer ranged high.

On the first of April we anchored at North Island, which is situated near the beginning of the straits of Sunda, in lat. 4. 38. S.

On the 4th we were off Java: and on the 30th of the month, we were in lat. 25. 13. S.

During the last month some of our people had slight fluxes. Two were indisposed this month with mild remittent fevers; and one was seized with the locked jaw,

whose case though violent and tedious terminated favourably*.

During the first week of May the weather was very temperate, the air being cooled by fresh breezes. From this to the 12th we had unsettled weather ; with rain, and some thunder and lightning. On the 14th it rained much. From this to the end of the month, being in high latitudes, and having brisk winds, and fair weather, the air was agreeable, cool, and temperate.

Some of our people had slight colds ; two complained of the rheumatism ; and two had fevers of a low kind, with obscure remissions, which yielded to the bark.

For the first four days of June, the weather was dry, though rather cold. To the 10th the air was agreeable in the day time ; but at night heavy dews fell. To the end of the month, we had a favourable south-east trade-wind and very pleasant weather.

Three had remittent fevers this month, and several complained of colds, and aching pains, the consequence of obstructed perspiration.

On the 4th of June we rounded the Cape of Good Hope, without any of our people having the least symptom of scurvy. On the 19th we anchored at St Helena, and remained there to the 28th. The ship's company were supplied with soup, and fresh beef ; but had no vegetables, except a little purslain.

I regretted much that we passed the Cape of Good Hope, without touching at it. Several of our officers, who had been there, represented it as the most delightful settlement to be met with in an India voyage. The

* See Chap. on the Tetanus.

country, they allowed, at a very little distance from the town, to be mountainous and barren. But the air healthy and temperate ; and, from the industry of the Dutch, the lands, near the town, are highly cultivated, and interspersed with orchards and vineyards. Here are to be procured, in abundance, all European and tropical fruits. The beef, mutton, and poultry are good. It may, therefore, be ranked amongst the best places for refreshment. But it unfortunately happens that ships can only put in here at particular seasons of the year ; and therefore when reduced by the scurvy, the stormy weather, and high seas, render it inaccessible.

From the beginning of July to the 13th, the weather was warm and pleasant, and the south-east trade-wind favourable.

From the 14th to the 25th, the weather was close, moist, and rainy. From this to the end of the month, although the thermometer was never under 79° , and often at 82° , and although we were daily approaching nearer the sun, yet the atmosphere was remarkably temperate ; having a constant brisk north-east trade-wind, and a clouded sky.

In the first week of August, the weather was warm and often sultry. From this to the 20th the air was cool and temperate. To the end of the month, the weather was constantly rainy, thick, or hazy, and very cold at night ; with heavy seas almost constantly breaking over the ship's deck.

About the end of last month, two seamen began to show a tendency to scurvy. By the 20th of this month many began to be slightly affected ; and eight were rendered unfit for duty by the distemper. Four were con-

fined with the rheumatism ; two were ill of the dysentery ; and one of cholic and constipation.

The two scorbutic patients who were first affected, had been long at sea ; had suffered frequently by the disease ; and were shipped at Gravesend immediately after their arrival from a long voyage from the West Indies. But, it must be remarked, that neither these two patients, nor any of the others who became scorbutic, had provided their usual stores of tea and sugar at China ; but had lived constantly on the ship's provision.

On the 1st of September we arrived in the Downs. During this voyage, in the outward passage, we only lost one person, viz. the native of India, of a consumption : and from the time we arrived at Madras, till we anchored in the Downs, there were carried off by disease, three of the ship's company* ; one by apoplexy, one by fever, and another by the locked jaw.

* A soldier long in the service of the company, was taken on board at Madras. He was pale, sallow, and emaciated. Without making any previous complaint, he was found dead in his hammock at Macao.

CHAP. III.

METEOROLOGICAL OBSERVATIONS MADE IN A VOYAGE TO MADRAS AND CHINA, IN 1771; AND IN RETURNING TO ENGLAND, IN THE YEAR 1772.

IN the following register the heat of the air was ascertained by Fahrenheit's thermometer. The mercury was contained in a cylinder, and not as usual in a globe, or ball. The instrument was fixed on the inside of the round-house window, unless when the weather obliged it to be shut; and then it was removed into the balcony. The former situation was preferred, in order to guard against the direct rays of the sun. But when both situations were equally shaded, no material difference was observed.

The thermometer was never carried out of the ship; and, therefore, at the different ports in India, it only shews the heat of air upon the sea, or on the water, at some considerable distance from land. In estimating the heat on shore, therefore, the mercury ought to be supposed to vibrate higher. On account of the sandy soil at Madras, it was found moderate enough to allow a thermometer to rise six or seven degrees higher ashore, than one, equally graduated, kept on board of ship.

It may be also proper to remark that although the thermometer always shews the exact heat of the air; yet the heat denoted by it does not correspond with the sensations of the body. For example when the air is calm and moist, betwixt the tropics; even although the mercury in the thermometer may have fallen a few degrees, the constitution experiences a more stifling heat than when it ranged higher, provided the air was clear, dry, and ventilated. In the hottest weather, indeed, which I have

experienced in India, when the mercury in the thermometer has stood at 90° ; if there happened to be an agreeable breeze, the mind has felt cheerful, and the constitution alert : whereas an inexpressible degree of langour, and depression has been felt when the air has been calm and moist, although the mercury did not rise to 80° . The same remark holds good in the contrary sensation of cold.

Thus in the latitudes off the Cape of Good Hope, in wet and stormy weather, when the mercury in the thermometer is below 60° , the constitution experiences a greater sensation of cold than it did in England, when the mercury in the thermometer stood about 40 degrees.

The following tables will be easily understood in general, by the marks at the top of each column. Some circumstances, however, require explanation. In the column marked thermometer, when $\odot$ occurs, it denotes that the thermometer rose to such a degree, by the instrument having been exposed to the direct rays of the sun. This experiment was seldom made, owing to the misfortune of having broke a small pocket thermometer ; and the inconvenience and danger of removing the large one.

The force of the winds is denoted by cyphers ; 0 calms ; 1 light winds ; 2 pleasant gales ; 3 fresh gales ; 4 storms. Rain is denoted by dots ; a light shower ; greater showers ; heavy rain ; and very heavy rain, in proportion to the number of dots. Thunder and lightning are specified by their initial letters.

METEOROLOGICAL REGISTER.

February, 1771.

Day.	Hour.	Therm.	Lat.	Winds.	Weather.
			N.		
21	11 a. m.	57	47 36	S W 3	Foggy
22	11 a. m.	58	47 26	4	Thick Fog
23	11 a. m.	59		2	Clear Sunshine
24	11 a. m.	68		2	Sunshine
25	11 a. m.	58	45 55	W 4	Sunshine
26	11 a. m.	58		S W 3	Hazy
27	11 a. m.	61	44 55	W	Fair
28	11 a. m.	59	44 28	S W 3	Sunshine

March, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	W.		
1	11 58 3 59		43 44	11 35	W b S 2	Sunshine
2	11 59 4 60		42 26	11 52	W N W 1	Cloudy
3	11 60 $\frac{1}{2}$ 4 63		40 46	12 26	N W 2	Clear
4	11 60 4 63		39 11	12 34	W b N 2	Clear
5	9 62 4 62 $\frac{1}{2}$		38 24	12 37	W b N 2	Cloudy
6	9 62 4 62		37 8	12 9	NWbN 2	Cloudy
7	9 59 4 61		35 36	13 54	N 2	Cloudy . . T L
8	9 62 4 64		34 40	15 38	N 3	Cloudy . . .
9	9 64 4 64			15 2	W S W 2	Cloudy
10	9 64 12 72	☉	32 9	14 27	S W 2	Sunshine
11	9 66 12 81		32 27	14 58	S 0	Sunshine
12	7 67 4 70		31 57	15 32	Variable 0	Sunshine
13	9 66 4 67		31 31	15 47	0	Cloudy
14	11 66 5 65		30 27	16 15	N N W 2	Cloudy
15	10 66 4 66		29 8	18 1	N E 2	Cloudy
16	9 66 4 66		27 43		N E 2	Cloudy
17	11 66 4 70		25 50	17 30	N E 2	Hazy
18	11 68 4 70		23 24	18 2	N E 2	Cloudy, L

March, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	W.		
19	9	69	28 41	17 42	N E 2	Cloudy
	12	95 ☉				
20	10	71	17 42	18 8	N E 2	Hazy
	4	72				
21	9	72	15 31	18 8	N E 2	Clear
	4	74				
22	9	74	13 20	18 8	N E 2	Hazy
	4	75				
23	9	75	10 37	18 8	N E 2	Sunshine
	4	75				
24	9	77	10 37	18 8	N 1	Fair
	4	78				
25	10	79	9 34	18 8	N 1	Sunshine
	4	80				
26	11	81	6 34	18 11	N W 2	Hazy
	4	82				
27	11	82	5 24	18 12	N 1	Hazy
28	11	82		18 5	N 1	Fair
	4	84				
29	4	85	4 44	17 49	N b E 1	Hazy, at night T L . . .
30	4	82	4 21	17 45	N E 1	Hazy .
31	4	83		17 24	0	. . .

April, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	W.		
1	8 82 4 82		1 56 17	26	Variable 0	Cloudy, at night ...
2	11 84		1 19 17	26	Variable 1	Cloudy
3	11 83		42 17	53	Variable 0	Cloudy ..
4	11 80 4 81		30 18	4	Variable 1	Hazy
			S.			
5	11 82 5 83		7 18	54	S E	2 Hazy
6	11 81 12 92	☉	1 19 19	40	S E	1 Fair
7	11 81 4 82		2 41 20	13	S E	2 Cloudy
8	11 82 4 83		3 47 20	45	S E	1 Cloudy
9	11 82 4 84		4 33 20	51	S E	1 Cloudy
10	8 84		6 3 21	9	S E	2 Hazy ...
11	8 83		8 27 21	45	S E	2 Cloudy
12	11 82 4 82		9 45 21	49	S E	2 Hazy
13	11 81 4 81		11 1 22	17	S E	2 Clear
14	11 81 4 82		12 19 22	47	S E	2 Hazy
15	11 81 4 82		13 33 23	17	S E	2 Fair
16	11 80 4 80		14 7 23	37	S E	2 Fair
17	8 79 3 80		14 15 23	55	S E	2 Cloudy
18	8 80 3		14 28 24	13	S E	2 Cloudy
19	8 80		15 32 25	3	S E	2 Cloudy
20	8 80 3 81		17 12 25	47	S E	2 Cloudy
21	8 80		18 43 25	29	Variable	Cloudy

April, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long from Lond.	Winds.	Weather.
			S.	W.		
22	8	80	20 3	25 14	S E 2	Cloudy
	3	81				
23	8	79			S E 2	Hazy
	3	79				
24	8	78	22 21		Variable 0	Cloudy
25	8	78	22 11	29 19	Variable 1	Rainy
26	8	78	23 16	29 6	E 1	Fair
27	8	78			Variable	
	3	76	24 38	28 28	E 2	Cloudy
28	8	78	25 28	27 23	E 2	Fair
29	8	77	26 9	26 43	E 1	Cloudy, ecl. of the moon
30	8	75				
	3	76	26 46	25 59	Variable 1	Fair

May, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			S.	W.		
1	8	72	27 59	24 38	Variable	2 Squally
		3 73				
2	8	69	28 45	23 22	E	4
		3 69				
3	8	66		21 55	NNW	Continual small rain
		3 67				
4	8	66	29 56	29 25	S S W	3 Cloudy
		3 67				
5	8	65		18 35	S S W	1 Lowring
		3 66				
6	8	70		15 19	N W	3 Dark and Cloudy
7	11	65	32 5	10 34	N b E	3 Cloudy
8	11	66	32 12	7 41	S W	2 Cloudy and fair
9	11	64	31 31	5 40	S S E	2 Clear
10	11	69	30 25	4 41	S E	2 Fair
		3 66				
11	11	69	31 6	4 36	S W	1 Variable rain
12	11	66	31 39	2 48	S W	2 Cloudy
		5 62				
13	11	63	31 50	2	S	2 Squally
		4 63		E.		
14	11	64	32 28	52	Variable	Cloudy
15	11	62	34 0	3 50	N	3 Fair
		5 60				
16	11	63	35 15	7 52	N E	3 Fair
		5 63				
17	11	61	35 40	10 54	S	3 Fair
		6 58				
18	11	63	36 0	12 40	N	1 Fair
		5 61				
19	11	62	36 9	16 47	N	2 Hazy
		5 61				
20	11	64	35 39	19 48	N	2 Cloudy
		5 60				
21	11	63	35 9		Variable	1 Hazy. Saw the Cape
		5 61				

May, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long from Lond.	Winds.	Weather.
			S.	E.		
22	11 58 5 56		34 50	24 12	Variable	Rainy . .
23	8 59 11 64		34 47	25 50	Variable	0 Pleasant weather
24	11 66 6 62		35 10	28 31	W 2	Fair
25	11 65 6 61		34 37	30 3	Variable	Squally . .
26	11 64 6 62		35 29	29 41	S E 3	Fair
27	11 66 5 65		36 49	30 50	N E 2	Cloudy and squally
28	11 69 5 68		37 5	32 56	Variable 3	Squally
29	11 68 5 66		37 15	33 40	Variable	Unsettled and rainy . .
30	11 65 4 64		35 39	33 37	Variable 2	Lowring & rainy . . . L
31	11 63 4 62		36 36	34 22	Variable 3	Rainy . . and squally

June, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			S.	E.		
1	11	64	35 24	36 15	S	3 Squally T L rainy . .
	5	63				
2	11	66		37 36	S	2 Cloudy . . .
	5	65				
3	11	66		39 15	N W	3 Fair
	5	64				
4	11	64	31 25	40 36	N W	3 . . . T L
5	11	69	29 38	41 55	W	2 Cloudy
	5	69				
6	11	70	28 35	42 34	W N W	2 Fair
	5	71				
7	11	71	28 6	43 56	N E	2 Fair
	5	70				
8	11	74	25 48		S W	2 Fair
	5	72				
9	11	80	26 47		E b S	3 Fair
	5	76				
10	11	81	26 45		N W	2 Fair
	5	74				
11	11	69	26 4		W S W	3 Cloudy
	5	68				
12	11	71	24 15		S S E	2 Cloudy
	5	70				
13	11	72	22 19		S S E	3 Fair
	5	74				
14	12	74	19 40		S S E	2 Fair
	5	75				
15	11	75	18 18		S S W	2 Fair
	5	76				
16	11	77	16 41		S S W	2 Fair
	5	78				
17	11	79	14 21		S S W	2 Fair
	5	80				
18	11	80	12 45		S S W	2 Cloudy
	5	80				

July, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	E.		
1	12	82	3 29	53 15	W S W 3	Cloudy
	6	81				
2	12	83	4 34	56 12	S W b W 3	Hazy . . .
	6	82				
3	12	85	5 23	58 32	S W b W 3	Cloudy
	6	83				
4	12	85	5 55	60 44	W S W 2	Fair
	6	84				
5	12	84	6 14	62 23	W b S 2	Fair
6	12	85	6 43	64 0	W b S 2	Squally . .
	6	83				
7	12	86	7 11	65 44	W b S 2	Cloudy . .
	3	88				
8	12	87	7 23	67 6	S W 2	Cloudy .
	3	88				
9	12	87	7 47	68 46	S W b W 2	Cloudy
	3	88				
10	12	86	8 10	70 44	S W b W 2	Squally . .
	3	88				
11	12	86	8 12	72 22	W S W 2	Fair
	3	87				
12	12	87	7 23	74 0	S W 2	Cloudy
	3	89				
13	12	86	6 36	75 45	W 2	Cloudy . .
	6	84				
14	12	85	5 47	77 43	W N W 2	Fair
	3	88				
15	12	86	6 24		W 2	Fair
	3	87				
16	12	89	7 8		S b W 1	Fair
	3	80				
17	12	87	7 12		N b W 1	Cloudy
	6	85				
18	12	87	7 3		S E 1	Fair
	6	85				

July, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	E.		
19	12 89		8 35		W S W 1	Cloudy
20	12 92 6 86		9 29			0 Fair
21	12 88 6 86		10 36		S W 1	Cloudy
22	12 88		11 23		S E b S 1	Fair
23	12 90 6 98		12 7		E	Cloudy
24	12 30 6 96		12 36		E 2	Fair
25	12 88		at Ma-	80 32		
26	12 90 3 93		dras		E 2	Squally . . . T L
27	12 90 3 93				S 2	Cloudy, T L
28	12 90 3 92				S 2	T L
29	12 93 4 96				S 2	Sea and land breezes
30	12 90 4 94				S 3	Fair, sea and land br.
31	12 91 4 93				S 3	Cloudy, sea and land br.

E

August, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
1	12	93	at Ma- dras.		land & sea 1	Cloudy, rainy .
	4	94				
2	12	92			land & sea 1	Rainy . .
	4	90				
3	12	90			land & sea 2	Fair
	3	91				
4	12	90			land 1	Cloudy
	4	92				
5	12	92			land 1	Rainy . .
	4	94				
6	12	89			land & sea 1	Fair
7	12	90			land & sea 1	Fair
	5	92				
8	12	93			land & sea 2	Rainy, T L
	7	96				
9	12	89			land & sea 2	Cloudy . .
	4	87				
10	12	93			land & sea 2	Rainy .
	4	88				
11	2	94			land 1	Rainy . .
	4	89				
12	12	93			land & sea 1	Fair
	4	90				
13	12	90			land & sea 3	Fair
	4	87				
14	12	89			land & sea 2	Fair
15	12	89			land & sea 1	Rainy .
	3	90				
16	12	90			land 2	Squally, rainy . .
	4	94				
17	12	94			land 2	Squally, rainy . . .
18	12	93			land 1	Fair
19	12	90			S 3	Rainy
	4	87				
20	8	90			land & sea 2	Fair
	3	94				
21	8	92			land & sea 1	Fair
	3	95				

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August, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Wind	Weather.
			N.	E.		
22	11 94 4 87				S W	2 Cloudy
23	10 86 3 88		10 58	81 48	S E	2 Fair
24	10 85 3 87		10 0	83 20	E	2 Fair
25	10 85 3 87		8 52	85 18	S W	1 Cloudy
26	10 86 3 89		7 32	87 14	S W	2 Fair
27	10 85 3 87		6 41	89 4	S W	2 Hazy
28	10 85 12 88 6 90		6 19	90 44	S W	1 Hazy
29	8 85 3 89		6 7	92 3	W	1 Cloudy
30	8 85 3 88		6 1		W	2 Cloudy
31	8 87 3 90		5 38		W	1 Cloudy

September, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	E.		
1	8	87	5 47		0	Hazy
	3	93				
2	8	85	4 48		Variable 1	Cloudy
	3	92				
3	8	85	4 22		N W 2	Rainy
	3	92				
4	8	85	3 45		W 1	Hazy, rainy, dews at n.
	3	89				
5	8	85	3 23		E 1	Rainy, T L
	8	88				
6	8	87	3 12		S E 2	Cloudy, at n. dews T L
	3	92				
7	8	85	3 23		S E 1	Cloudy, at n. dews T L
	3	90				
8	8	85	3 7		Variable 1	Cloudy, . . . dews T L
	3	89				
9	8	85			N 1	Rainy . . . T L at n.
	3	90				
10	8	80	2 0		N 1	Fair
	3	85				
11	8	85	2 16		S 1	Cloudy
	3	90				
12	8	85		102 11	Var. 1, 0	Rainy T L
	3	89				
13	8	85	Saw		E 2	Fair
	3	87	Ma-			
14	8	85	lacca		E 1	Cloudy . .
	3	88				
15	8	85			S	Rainy . .
	3	88				
16	8	85	St.		W 1	Fair
	3	89	John's			
17	8	86	1 44		N 1	Rainy . . .
	3	89				
18	8	86			N 0	Fair
	3	89				
19	8	85	2 36		S 1	Squally . . .
	3	88				

September, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	E.		
20	8 85 3 87		3 4		S 2	Fair
21	8 84 3 86		4 44	105 21	S 2	squally . . . T L
22	8 83 3 79		6 5	105 36	S b E 1	Rainy . . . and foggy
23	8 86 3 87		7 5	105 37	Variable	Cloudy . . .
24	8 84 3 86		8 35		S W 2	Fair
25	8 83 3 85		9 58		S W 2	Hazy
26	8 84 3 86		10 46	112 2	W 2	Cloudy, T L
27	8 84 3 86		11 28	112 30	W 2	Unsettled & rainy . . .
28	8 83 3 86		11 57	113 18	N 2	Squally, rainy . . . T L
29	8 84 3 86		12 58	113 52	N W 1	Cloudy .
30	8 85 3 88		12 33	114 16	0	Clear and sultry

October, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	E.		
1	8	85	12 13	114 33	Variable 1	Cloudy
	3	88				
2	8	86	12 44	114 57	N W b W 1	Fair
	3	89				
3	8	85	13 15	115 17	N W 1	Fair
	3	90				
4	8	86	13 57	115 33	N W 1	Cloudy . .
	3	90				
5	8	86	13 57	115 55	N W 2	Cloudy .
	3	90				
6	8	86	14 28	116 14	N W 1	Cloudy .
	3	86				
7	8	86	14 43	116 11	Variable	Squally .
	3	86				
8	8	85	14 33	116 14	Variable	Hazy T L
	3	87				
9	8	84	15 8	116 0	Variable 0	Rainy
	3	86				
10	8	85	16 7	115 12	N E 2	Dark and Cloudy . . L
	3	87				
11	8	86	16 36	114 52	N E 3	Cloudy L
	3	87				
12	8	85	17 0	114 49	N E b E 2	Cloudy, rainy .
	3	88				
13	8	85	17 36	114 58	E N E 2	Cloudy
	3	87				
14	8	84	18 57	114 56	E N E 2	Fair
	3	86				
15	8	84	20 18	114 46	E N E 2	Cloudy
	3	86				
16	8	85	20 15	115 21	N E 3	Cloudy
	3	86				
17	8	84	21 9	115 18	N E 3	Cloudy
	3	86				
18	8	80	21 48		E N E 2	Fair
	3	84				

October, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
19	8 80 3 85		At Mac- cao.		S W 1	Fair
20	8 81 3 84				S W 1	Fair
21	8 82 3 85				S E 1	Fair
22	8 78 3 80				N 2	Fair
23	8 76 3 83				N 1	Fair
24	8 76 3 84				N 0	Fair
25	8 78 3 84				N 1	Fair
26	8 80 3 85				N E 2	Cloudy
27	8 79 3 84				N 1	Cloudy
28	8 80 3 85				N 1	Fair
29	8 75 3 78		At Wam- poa, China.		N E 1	Cloudy and rainy
30	8 72 3 74				N 3	Cloudy
31	8 70 3 72				N 2	Rainy

November, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
1	8	70	At China		N	1 Rainy
	3	72				
2	8	71			N	1 Clear sunshine
	3	74				
3	8	75			N	1 Fair
	7	77				
4	8	75			N	1 Fair
	2	80				
5	9	78			N	1 Fair, dews at night
	4	79				
6	11	76			N	1 Fair, dews at night
7	10	78			N	1 Clear
	4	78				
8	10	70			N	2 Heavy dews at night
	5	77				
9	11	75			N	1 Fair
	4	73				
10	11	77				Fair
	4	75				
11	12	76			N	2 Cloudy
	4	78				
12	11	69			N E	3 Fair
	4	65				
13	12	66			N	3 Cloudy
	4	66				
14	11	67			N	2 Fair, dews at night
30	8	65			N	1 Fair, dews at night
	3	67				
	11	60				

From the 14th to the 30th of this month, no regular thermometrical diary was kept. The weather, though temperate and warm in the day-time, was chilly at nights, with heavy dews.

December, 1771.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
25	8	61	At China.		N	2 Fair, at night dews
	6	59				
26	8	63			N	1 Cloudy
	3	62				
27	8	62			N	2 Fair, at night dews
	6	58				
28	8	62			N	1 Cloudy
	11	55				
29	8	60				
30	8	53			N E	Fair
	11	54				
31	8	54			S	Fair
	4	58				

From the beginning to the 25th, the weather was temperate in the middle of the day, the winds northerly and north-easterly, with dews at night. It rained continually on the 15th, but the rest of the month was fair.

January, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
1	8	56	At China.		S	1 Fair
	3	66				
2	8	59			S	1 Fair
		8 66				
3	8	60			S	1 Fair
		8 67				
4	8	62			S	1 Fair
		8 67				
5	8	63			S	1 Fair
		8 66				
6	8	53			N E	2 Cloudy
		8 56				
7	8	62			E	2 Fair
		4 60				
8	8	60			E	2 Fair
		4 63				
9	8	61			E	1 Cloudy
		4 62				
10	8	62			E	2 Fair
11	8	62			E	2 Hazy
		3 64				
12	8	64			E	1 Cloudy . .
		3 63				
13	8	62			E	2 Cloudy
		4 64				
14	8	5			N E	2 Cloudy
		4 54				
15	8	54			N E	2 Rainy .
		4 60				
16	8	56			N E	2 Cloudy .
		3 58				
17						
18						
19	8	49			N	1 Cloudy and rainy .
20	8	50				
		3 54				
22	8	54				Fair . at night
		3 54				

January, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
23	8 52		At China.		N E	2 Fair
	3 53					
24	8 48				N E	2 Rainy . .
	4 50					
25	8 50				N E	3 Cloudy, . at night
	8 46					
26	8 42				N E	3 Rainy
	4 46					
27	8 50				N E	3 Rainy . . .
	4 52					
28	8 51				N E	3 Fair
	4 53					
29	8 54				N E	2 Fair
	4 56					
30	8 54				N E	3 Cloudy
	3 55					
31	8 56				N E	2 Rainy . . .
	4 56					

February, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
1	8 55 3 57		At China.		N E	1 Rainy . . .
2	8 56 3 58				N E	3 Rainy
3	8 58 6 59				N E	2 Fair
4	8 59				N E	2 Fair
5	8 60 3 59				N E	2 Rainy .
6	8 60 3 59				N E	1 Rainy .
7	8 60				N E	1 Cloudy
8	8 62				S	1 Fair
9	8 63 3 62				S	2 Fair
10	8 64 3 61				W	2 Fair
11	8 64 3 63				S W	2 Fair
12	8 63				S W	1 Fair
13	8 61 8 58				N	1 Cloudy
14	8 59 8 57				N	2 Gloomy . . .
15	8 59 3 60				N	1 Fair
16	8 62 3 63				N	2 Fair
17	8 62 3 61				S	2 Rainy . .
18	8 62 3 60				S	2 Cloudy . .
19	8 61 3 62				N	1 Cloudy
20	8 62 3 64				N E	1 Fair

February, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
21	8 65 3 66		At China.		N 1	Fair
22	8 68 3 70				N E 1	Fair
23	8 68 3 70				N 1	Fair
24	8 69 3 70				N E 1	Clear sunshine
25	8 69 3 50				N E 1	Fair
26	8 70 3 72				N E 1	Fair
27	8 72 3 74				N E 1	Fair
28	8 74 3 76				S 2	Fair, at night dews
29	8 73 3 74				S 1	Fair, at night dews

Murch, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
1	8 73 3 74		At Wam- poa, China	E.	S	2 Fair
2	8 72 3 74				S	2 Cloudy
3	8 72 3 72				S	2 Gloomy, T L . . .
4	8 69 3 71				S	2 Gloomy . . .
5	8 59 3 60				N	3 Gloomy
6	8 58 3 53				N	2 Cloudy and dark
7	8 62 3 67		Mac- cao.		N	3 Cloudy
8	8 67 3 70		N.			
9	8 75 3 76		18 0	114 35 E	2	Fair
10	8 77 3 78		18 8	115 16 E	2	Cloudy . .
11	8 79 3 80		16 51	115 24	Variable 1	Fair
12	8 79 3 80		16 16	115 20	Variable 2	Cloudy
13	8 81 3 81		14 54	115 1	Variable 2	Cloudy
14	8 82 3 83		13 26	114 4	E N E 2	Clear
15	8 83 3 84		12 32	113 24	E 2	Fair
16	8 83 3 84		11 40	112 44	E	Fair
17	8 83 3 84		11 2	112 5	E 1	Cloudy
18	8 83 3 83		10 23	111 26	E 2	Fair
19	8 83 3 83		9 15	109 42	E N E 2	Fair

March, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	E.		
19	8	84	8	8 108 27	N E 2	Hazy
	3	84				
20	8	83	6	26 107 23	N E 2	Fair
	3	83				
21	8	84	5	6 106 2	N E 1	Fair
	3	83				
22	8	83	3	4	N E 3	Cloudy ..
	3	83				
23	8	84	2	13	E N E 2	Hazy
	3	83				
24	8	83	0	20	Variable 1	Cloudy ..
	3	84				
			S.			
25	8	82	1	14	N E 2	Fair
	3	83				
26	8	83			NE 1	Fair
	3	85				
27	8	84		In the		
	3	86	2	31 Straits	Variable 0	Cloudy
	12	108		of		
28	8	84	3	5 Banca.		Cloudy .
	3	85				
29	8	83				
	12	106	3	7		0 Cloudy .
	3	87				
30	8	83	3	18		0 Cloudy .
	3	86				
31	8	83	4	38	E 2	Cloudy .
	3	86				

April, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
				E.		
1	8 83 3 88		At North Island		N W 1	Fair
2	8 82 3 89				N W 1	Fair
3	8 83 3 86				N W 1	Fair
4	8 83 3 85		S. 6 56	Saw Java	N E 2	Cloudy
5	8 83 3 85		7 43	102 59	Variable 1	T L rainy . . .
6	8 83 3 85		8 55	102 14	E 2	Cloudy
7	8 82 3 85		9 58	101 57	N E 3	Cloudy . .
8	8 83 3 84		11 41	101 12	E 3	Cloudy
9	8 82 3 83		13 18	99 26	S E 3	Cloudy
10	8 81 3 81		14 33	96 52	S E 3	Hazy
11	8 80 3 80 $\frac{1}{2}$		15 24	94 31	S E 2	Cloudy .
12	8 80 3 80		15 56	91 53	S E 3	Hazy
13	8 80 3 80		16 24	89 7	S E 2	Cloudy . . .
14	8 80 3 80		16 53	86 21	S E 2	Cloudy, at night
15	8 89 3 80		17 26	83 52	S E 2	Cloudy, at night
16	8 80 3 81		18 5	81 15	E S E 2	Cloudy, at night
17	8 80 3 80		18 42	79 3	E 3	Cloudy, ecl. of moon
18	8 79 3 79		18 50	77 30	E 1	Fair

April, 1772.

Day.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
19	879 380	S. 18 52	E 75 47	E b S 2	Fair
20	879 379	19 23	73 30	E b S 2	Fair
21	879 379	19 59	71 50	E b S 1	Fair
22	879 379	20 30	70 41	E b N 1	Fair
23	878 379	20 56	69 14	E b S 2	Cloudy
24	878 378½	21 28	67 44	Variable 2	Cloudy, dews at night
25	876 377	22 18	65 22	E b S 3	Cloudy, dews at night
26	878 380	23 9	62 43	Variable 2	Fair
27	879 380	24 3	60 54	E 1	Fair
28	880 378	24 52	59 42	Variable 2	Fair . . afternoon
29	877 376	25 17	59 6	N 1	Fair, T L . . at night
30	872 372	25 13	56 36	S b W 2	Cloudy

May, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			S.	E.		
1	8	74	26	13 54	0 S	3 Fair
	3	75				
2	8	75	27	21 52	4 S E	2 Fair
	3	75				
3	8	76	28	4 49	49 E	2 Fair
	3	76				
4	8	74				
	3	78	28	57 47	39 E	3 Cloudy
	6	74				
5	8	74	29	51 45	31 E	2 Fair
	3	78				
6	8	74	30	43 43	29 E N E	2 Variable . . . T L
	3	75				
7	8	76	31	2 42	29 N W	3 Cloudy L
	3	76				
8	8	74	29	54 41	52 W	2 Fair
	3	75				
9	8	76	31	22 39	34 N E	3 Squally, L
	3	75				
10	8	76	30	56 39	22 S W	4 Unsettled L
	3	77				
11	8	65	30	48 39	2 S W	4 Squally
	3	68				
12	8	66	30	59 38	12 Variable	1 Fair
	3	69				
13	8	68	31	30 36	51 W	3 Cloudy
	3	68				
14	8	70	31	41 36	36 W	3 Fair, . . . at night
	3	71				
15	8	70	31	41 36	28 N	2 Hazy
	3	72				
16	8	76	32	16 36	16	0 Cloudy
	3	74				
17	8	75	33	30 35	18 N E	2 Fair
	3	72				
18	8	75	34	58 33	24 N	3 Hazy
	3	71				

May, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			S.	E.		
19	8 74 3 72		35	5 32	16 W	1 Fair
20	8 62 3 60		35	42 31	34 N W	3 Cloudy
21	8 65 3 65		34	52 31	34 W	4 Cloudy .
22	8 65 3 64		35	22 31	43 W	4 Squally
23	8 65 3 65		35	3 31	34 W	3 Unsettled . . .
24	8 66 3 66		34	35 31	20 W	2 Rainy
25	8 74 3 75		34	50 30	18 N E	3 Fair
26	8 70 3 72		35	17 29	33 N E	3 Hazy, L at night
27	8 70 3 65		35	47 28	8 S W	3 Fair
28	8 70 3 65		35	40 27	38 N W	2 Fair
29	8 68 3 62		35	9 27	20 W	2 Cloudy .
30	8 65 3 64		34	58 27	4	0 Fair
31	8 64 3 63		35	10 25	54 N W	2 Fair

June, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			S.	E.		
1	8 63 5 61		35 22	25 41	N W	2 Cloudy, L
2	8 55 3 57		35 32	25 37	W	2 Squally
3	8 58 3 59		34 37		Variable	2 Cloudy
4	8 64 3 61		32 2		S E	2 Fair
5	8 65 3 62 6 60		31 35	14 39	E	2 Fair, dews at night
6	8 63 3 63		29 39	12 43	S E	2 Fair, dews at night
7	8 64 3 62		28 3	11 13	S S E	2 Fair, dews at night
8	8 64 3 66		26 45	9 58	S S E	2 Fair, heavy dews at n.
9	8 65 3 66		25 42	9 5	N W	1 Fair, heavy dews at n.
10	8 66 3 67		24 8	8 33	W	2 Cloudy
11	8 67 3 68		23 20	8 8	S b E	1 Fair
12	8 71 3 68		23 0	7 53	S S E	1 Clear
13	8 68 3 67		22 4	7 3	S W	2 Clear
14	8 68 3 67		20 2	5 27	S b E	2 Cloudy
15	8 71 3 67		18 58	3 31	S E b S	3 Cloudy
16	8 72 3 69		17 21	1 29	S E	3 Cloudy
17	8 70 3 68			W. 0 31	S E	3 Cloudy

June, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
18	8 72 3 72	At St. Hele- na.	S. 16 0	W. 2 26	S E b S 2	Fair
19	8 72 3 73				E S E 2	Cloudy
20	8 72 3 73				S E 1	Fair
21	8 74 3 73				S E 1	Cloudy . . .
22	8 72 3 75				S E 1	Squally .
23	8 75 3 75				S E 1	Clear
24	8 75 3 74				S S E 1	Cloudy
25	8 74 3 74				S E 1	Cloudy
26	8 74 3 73				S E 1	Fair
27	8 75 3 75				S E 2	Squally .
28	10 75 3 74			7 10	S E 2	Squally
29	8 73 3 73		14 42	8 57	S E b E 2	Fair
30	8 73 3 74		13 2	10 29	S E 2	Cloudy

July, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			S.	W.		
1	8	75	11 40	11 32	S E b S 2	Dark clouded sky
	3	74				
2	8	76	10 31	11 50	S E b S 2	Cloudy
	3	75				
3	8	77	9 39	12 15	Variable 1	Cloudy
	3	76				
4	8	78	8 54	12 58	S E . 1	Fair
	3	79				
5	8	80	8 17	13 37	S E b S 2	Cloudy
	3	79				
6	8	80	6 56	14 26	S S E 2	Cloudy .
	3	80				
7	8	80	5 13	15 28	S E 2	Fair
	3	81				
8	8	82	3 39	16 36	E 2	Fair
	3	80				
9	8	81	1 38	17 56	S E 3	Fair
	3	80				
10	8	82	N.			
	3	79	0 25	19 12	S E 3	Clear
11	8	82	2 19	20 22	S b E 2	Cloudy
	3	80				
12	8	81	3 57	21 22	S S E 2	Cloudy
	3	82				
13	8	83	5 12	21 48	S S E 2	Cloudy, L at night
	3	85				
14	8	86	6 10	22 3	N N W 1	Rainy
	3	78				
15	8		7 39	22 29	Variable .	Rainy . . .
	3					
16	8	82	8 26	22 44	S S E 1	Cloudy . . . T L
	3	79				
17	8	79		22 56	Variable 1	Cloudy
	3	78				
18	8	76	8 35	23 4	Variable 0	Squally . . .
	3	76				

July, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.		
			N.	W.				
19	8	76		23	22	Variable 0	Rainy	
	3	77						
20	8	79		23	55	Variable 1	Cloudy . .	
	3	78						
21	8	80	11	0	24	30	N W 2	Cloudy .
	3	82						
22	8	81	11	23	25	10	Variable	Squally .
	3	85						
23	8	81	12	7	25	54	N E 2	Cloudy .
	3	84						
24	8	82	13	35	26	32	N E 2	Cloudy . .
	3	80						
25	8	81	15	5	27	24	N E 3	Cloudy .
	3	82						
26	8	80	16	9	28	56	N E 3	Fair
	3	82						
27	8	79	17	39	30	31	N N E 2	Cloudy, . night
	3	81						
28	8	80	19	0	32	14	N E 3	Cloudy
	3	82						
29	8	80	21	2	33	48		Cloudy
	3	80						
30	8	81	23	18	34	17	E N E 3	Cloudy . .
	3	82						
31	8	82	25	27	35	38	N E 3	Fair
	3	83						

August, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long. from Lond.	Winds.	Weather.
			N.	W.		
1	8 81 3 82		27 9	37 17	N E	1 Cloudy
2	8 80 3 80		28 15	38 33	N E b E	1 Cloudy · at night
3	8 82 3 82		29 41	38 59	N E	2 Fair
4	8 82 3 83		30 50	38 41	E	1 Cloudy
5	8 82 3 84		32 16	38 33	E S E	1 Cloudy
6	8 85 3 86		32 0	38 56	N E N E	0 Fair · 3 Rainy · ·
7	8 79 3 80		33 21	39 42	N E	2 Cloudy
8	8 79 3 80		34 21	40 36	N E	2 Fair
9	8 81 3 80		34 58	40 44	S	0 Cloudy ·
10	8 81 3 82		35 16	39 51	S E	2 Cloudy ·
11	8 79 3 80		37 53	38 29	S W	2 Fair
12	8 78 3 80		39 25	36 37	N W	2 Cloudy · ·
13	8 74 3 78		40 0	35 22	W	1 Cloudy
14	8 76 3 75		41 0	33 34	W	2 Hazy · ·
15	8 76 3 77		41 4	31 56	N E	2 Cloudy
16	8 75 3 76 69		39 50	30 41	E N E	2 Fair
17	8 75 3 74		40 21	31 13	E	2 Fair

August, 1772.

Day.	Hour.	Therm.	Lat. obs.	Long from Lond.	Winds.	Weather.
			N.	W.		
18	8 74 3 74		40 42	29 0	S W	1 Fair
19	8 72 3 74		41 48	26 53	W	2 Hazy
20	8 72 6 65		42 43	24 54	W NE	3 Squally . . .
21	8 68 3 70 6 68		43 23	21 7	NW	3 Cloudy
22	8 66 6 64		44 37	17 59	N W	4 Rainy . .
23	8 62 6 63		45 57	14 38	N W b N	4 Squally thick weather
24	8 63 6 61		47 24	12 15	N N W	Squally, cold at night
25	8 62 6 62		48 38	10 48	N W	2 Cloudy, very cold at n.
26	8 60 6 62		48 10	9 30	S S E	2 Hazy and squally
27	8 64 6 63		48 36	6 19	E	2 Hazy and raw weather
28	8 64 6 63		49 12	2 34	S W	4 Cloudy and thick
29	8 65 6 63		49 21		S W S W	2 Cloudy, at night thick 3 and-hazy
30	8 65				S W	3 Hazy and thick weather
31	8 65 6 64		Isle of Wight		W	3 Hazy

CHAP. IV.

A GENERAL ACCOUNT OF THE COUNTRY, AIR AND PREVAILING DISEASES,
IN VARIOUS PARTS OF ASIA.

HAVING, in the former chapter, made some observations upon the weather and diseases, which most frequently occur in voyages to the East Indies, I shall now proceed to give a general account of the situations ; changes of the seasons, and other circumstances ; which produce land diseases, in various parts of Asia.

I shall begin with taking a cursory survey of the coasts of Malabar, and Coromandel : then passing to Bengal, I shall proceed to the eastern coast, from Aracan to the streights of Malacca, and Islands adjacent : and lastly end with the port of Canton, which is now the only part of the Chinese empire frequented by Europeans.

 SECT. I.

THE COASTS OF MALABAR AND COROMANDEL.

Cape Comorin lies in about 7 deg. 56 min. N. Near the shore, the land is low, and covered with trees ; but at a little distance from the sea, a ridge of high mountains takes their rise, and extending northward, divides the coast of Malabar from that of Coromandel. These are usually called the Gatta, or Balagate mountains. The difference of the seasons, which are exactly opposite on the two coasts, depends entirely on the intervention

of these high mountains; the coast of Malabar enjoying dry serene weather while the opposite coast is drenched in rain.

The first settlement on the Malabar coast of any note, belonging to the English, is Anjanga. Near the shore, the land is low, and woody; and the water bad.

Cocheen, belonging to the Dutch, stands low, and is situated on the banks of a river. In the wet season, torrents of rain descending from the mountains, render the water thick and muddy. It is supposed that the monstrous swelled legs, to which the natives are subject, so well known over all India by the name of Cochin legs, are occasioned by the impurities of these waters. However this may be, from the longest residence, no European becomes liable to the same disease. It cannot, indeed be properly termed a disease: for the natives of Cochin are extremely healthy: neither is the bulk of their legs the least inconvenience to them. No preternatural weight is to be observed: they are strong-bodied, and enjoy as much agility; as if they were totally exempt from this unseemly deformity.

From Cochin to Calicut, where the English have a factory, the coast is beautifully diversified with rising hills and mountains.

Telliecherry, a town and fort, belonging to the English, lying in 11 deg. 50 min. north latitude, is finely situated; abounds with refreshments; and is extremely healthy.

The island and city of Goa, the capital of the Portuguese, is now likewise tolerably healthy. But this climate was represented formerly to have been productive of malignant fevers, carrying off Europeans immediately on their first arrival. Nor is this to be wondered at, when we are told, that the only method of cure was repeat-

ed bleeding ; even to five times a day, in small quantities*.

The island of Bombay, lying in 19 deg. north latitude, of itself is barren ; and the Gentoos on the continent, believing in transmigration, from a principle of religion, allow none of their cattle to be slaughtered. The inhabitants however, are abundantly supplied with provisions from Surat. This small island is very populous. The natives from the continent flock under the English government, where their liberties are more secure. The town and fort, which are situated on the south-east of the island, stand dry ; and from the improvements which have already been made, it may be esteemed amongst the number of our healthiest settlements.

The last place I shall mention is Surat : the city, situated about fifteen or sixteen miles up the country, is large, spacious, and pretty healthful.

The whole coast of Malabar is temperate, and healthy, when compared with many of our settlements in India. It enjoys cool refreshing land and sea breezes upwards of six months in the year : which generally begin in October, and continue till the end of March. But as soon as the south-west monsoon sets in, in April, these breezes become uncertain ; and for the most part, disappear. The dry season, on this coast, is from October to April ; and the rainy season in the opposite months.

In the wet season, Europeans are subject to fevers and fluxes: the last is the most frequent distemper, which, however, is never so fatal as at Bengal, Batavia, and other unhealthy places in the East Indies. The cholera is also a very frequent disease at Bombay : and, on this coast,

*Balæus's description of the coast of Malabar.

the barbers is more common than in any other part of India. This last disease is a species of palsy, affecting the limbs, and frequently the organs of speech, with inability of motion. It is brought on by exposition to the cold land winds in January and February. It is very obstinate, and seldom removed till a return of the warm weather : but the few Europeans, whom I saw ill of it, were easily cured by a change of climate, and a sea voyage, without having recourse to any medicine.

Before I leave this part of the East Indies, I shall take notice of the temperature of some places, frequented by Europeans, in Persia and Arabia.

Gambroon is situated on a flat sea shore, at the entrance of the Persian Gulph, near the foot of a sandy barren mountain. The air is so intolerably hot that foreigners can scarcely live here during the hot months, from May till September : and even the natives are obliged to retire to their country houses on the mountains. December, January, and February are the cool months. Those who venture to reside here during the hot season, are subject to dangerous fevers of the intermittent or remittent type, often terminating in a diseased state of the liver.

The same temperature prevails at Bassora, Bagdat, and at Karec, in the Persian Gulph, where the Dutch* have a factory ; and the natives, as well as foreigners, are subject to fevers and fluxes in the rainy season.

Mocha situated at the entrance of the Red Sea in 13° 45' north, is a city of considerable extent. The heat here is very excessive ; but the air being pure, it is tolerably healthy. I was informed by a gentleman who often visited this city, that the night dews were very salutary ; and

* See Mr. Ives' Journal.

that he, according to the custom of the place, slept every night on the top of his house, to enjoy their cooling effects.

I shall now proceed to the eastern coast of this peninsula, usually called Coromandel.

The southern part of this coast is little frequented, till we arrive at the pleasant Dutch settlement at Negapatan; lying in 11 deg. 10 min. north latitude, abounding with refreshments of all sorts. A little farther up is the Danish settlement of Tranquebar.

The first settlement which the English had was Fort St. David's, now in ruins; but they reside at Cadelore, a pleasant village, lying about three miles to the southward of the fort.

Madras is our only presidentship on this coast. The fort is strong, the houses of the residents well built and airy. A pleasant village, called the Black Town, lies to the northward about a mile, and is promiscuously inhabited by the English; Gentoo merchants; and Banians. This village is populous and healthy. All the country around is dry, flat, and pleasant; till we arrive near St. Thomas's Monut, eight miles from Madras; where the residents are continually making parties of pleasure, which greatly contribute to their health; the air here being particularly pure and salutary.

The French, English, and Dutch, have factories at Masulipatan: but the pleasant, and healthy settlement of Vizagapatan belongs entirely to the English.

The soil on this coast, near the shores, for a mile or two, is dry and sandy: but the inland country is diversified with hills and verdant pastures. I have been informed by a gentleman in India, who had travelled all over the Carnatic, that the whole tract of country is, in general, remarkably pleasant and fertile: and even in

the warmest months, the air is so salutary, that an exposure to the sun, fowling, and athletic exercises are attended with no inconveniency to health. At Madras, however, the excessive heat renders such amusements impracticable in the height of the day.

On this coast, the temperature of the air is various at different seasons of the year. In January, February, and March, the weather is very temperate, and generally fair: but in May, June, and July it becomes insupportably sultry, owing to the land winds passing over long tracts of sand. These winds often blow with such violence, that the air is obscured with dust; however these hurricanes are of short duration, and always disappear with the rains in October.

The land winds generally blow from midnight till noon; and are succeeded by refreshing sea breezes, which continue till nine or ten at night, and frequently the whole night. By these means, the effects of a hot air are prevented; which, if constant for any length of time, would produce baneful complaints: besides, these hot suffocating land winds are not always constant, whilst refreshing sea breezes seldom fail to return regularly during the hot months.

The north-east monsoon, which, on this coast, ushers in the wet season, begins in October, and continues till March; but the rains seldom last longer than December. As there are no evaporations in consequence of the rains, these being absorbed almost as soon as they fall, the country being dry, and there being no marshes of any extent, the wet season is the most healthy period in the year.

From this account it will appear, that this coast must be particularly salutary. The residents, indeed, enjoy good health. The only diseases to which they seem to be particularly subject, are great secretions of bile, accom-

panied with nausea, sickness at stomach, and sometimes a purging. The people at Madras are so well acquainted with this complaint, that they are generally their own physicians: and, in the warm months, it is no uncommon thing to see a patient one hour vomiting abundance of gall, and the next hour taking a ride into the country. This disease is in general so mild with them, that it seldom requires any other cure than the exhibition of a gentle puke, or laxative.

But amongst new settlers, these bilious diseases are more violent, and dangerous, as we have already* observed; and often terminate in cholera morbus; bilious cholic, with spasmodic affections † of the muscles; and in dysentery.

* See page 28.

† Spasmodic affections were the first diseases which appeared amongst the troops that arrived at Madras, in October, 1782. They were not only extremely general, but carried off fifty men within the first three days after they were landed; and in less than a month upwards of a thousand were attacked. These complaints began with coldness of the hands, feebleness of the pulse, and spasmodic contractions of the extremities, soon extending to the muscles of the abdomen, diaphragm, and ribs. The muscles soon became rigid as cartilages; sometimes keeping the body immoveably extended; sometimes bending the trunk through its whole length forwards; and sometimes, though seldom, backwards. "The hands and feet were sodden with cold sweats; the nails livid; the pulse feeble and frequent; and the breath so condensed as to be both seen and felt, issuing in a cold stream at a considerable distance. The thirst was insatiable; the tongue whitish, but never dry: vomitings became almost incessant; the spasms, cold sweats, and thirst encreased with the vomitings; which last, soon terminated the existence of the patient."—"Some died in the first hour of the attack: others lived a day or two with remissions; when they died either of universal spasms or an apoplexy:

Amongst Europeans who undergo much fatigue, and particularly amongst the military, the hepatitis; swellings, and obstructions of the liver, are very frequent diseases; and a number of soldiers are annually carried off by fevers and fluxes. It may therefore be concluded, that although the coast of Coromandel is by far the most healthy of all our settlements in India, yet the diseases which occur there, do not differ from those of the more unhealthy situations; but by their being milder in their nature, and seldom epidemic.

We may likewise observe, even on this healthful coast; that the fair sex, enjoying, indeed, a remarkable immunity from the endemic and popular diseases of a warm climate, are, however, subject to many inconveniences after a very short residence: The lovely bloom and ruddy complexions, they bring from Europe, are soon converted into a languid paleness: they become supine, and enervated; and suffer many circumstances of ill health peculiar to the sex, from mere heat of climate and relaxation of system. Parturition, however, is not attended with such great danger here as at Bengal; neither is the puerperal fever of such a putrid nature.

The southern parts of India are subject to very great

on dissection, it appeared that no injury had been sustained by the brain, liver, gall bladder, stomach or heart."

Dr. Girdlestone, from whom the above account is taken, considers cold as the most general exciting cause of these spasmodic affections: and it appears that not only the damps from the earth; but drinking large quantities of cold water after intoxication, and sudden exposition to the winds when wet with perspiration, had the most powerful influence in producing a sudden and dangerous attack.—See Girdlestone's essay on spasmodic affections in India; and for the cure, the chapter on tetanus, in the following pages.

heats ; which would be insupportable, without the periodical returns of the monsoons. As we have so frequent occasion to use this term, it will not be improper to give some explanation of it before we proceed farther.

On the southern coasts of Asia, from Arabia to China, the winds are periodical, blowing in one direction one half of the year, and in the direct opposite during the other. These winds, by navigators, are called monsoons ; and the regularity of their direction seems to depend on the annual motion of the sun. When the sun's declination is north, betwixt March and September, the monsoons, or periodical winds, are westerly : and as soon as his declination is south, betwixt September and March, the monsoon shifts, and blows easterly during these six months. On the coasts, as well as over all the Arabian, Indian, and Chinese seas, the periodical winds are invariably regular, the south-west monsoon blowing from April to March, and the south-east monsoon in the opposite months. But inland, on the continent, great variations take place, owing to the soil and other dispositions, which alter the course of these winds.*

The south-west monsoon brings the rainy season with it in every part of India, except on the coast of Coromandel, owing to the opposition of the high mountains of the Balagate. On this coast, the wet weather happens in the north-east monsoon, which every where else blows clear and fair.

At the time of the shifting of the monsoons, a great change in the weather takes place. The sky generally becomes dark, cloudy, and boisterous ; and torrents of rain descend, accompanied with thunder and lightning.

* For a more particular account, see Philosophical Transactions.

At Bengal, and in China, the violence of these storms is such as to render all navigation extremely dangerous on these coasts. On shore, trees are torn up by the roots; and great damage done to houses.

Such tremendous storms as these happen frequently in warm climates, about the equinoxes: in the West Indies, they are called hurricanes; in the East Indies, the breaking up of the monsoons; and in the Chinese seas, perhaps from their greater violence, they are distinguished by the name of a typhoon.

Such awful convulsions of the elements as happen in these storms, are beautifully described by Virgil, in the following lines:

Sæpe etiam immensum cœlo venit agmen aquarum,
 Et sædam glomerant tempestatem imbris atris
 Collectæ ex alto nubes: ruit arduus Æther,
 Et pluviâ ingenti sata læta, boûnque labores
 Diluit: implentur fossæ, et cava flumina crescunt
 Cum sonitu, fervetque frêtis spirantibus Æquor.
 Ipse pater, mediâ nimborum in nocte, coruscâ
 Fulmina molitur dextrâ: quo maxima motu
 Terra tremit, fugère feræ, et mortalia corda
 Per gentes humilis stravit pavor:
 ingeminant Austri, et densissimus imber:
 Nunc nemora ingenti vento, nunc litora plangunt.¹

SECT II.

BENGAL, THE EASTERN COAST AS FAR AS MALACCA, AND THE
ISLANDS ADJACENT.

THE extensive kingdom of Bengal passes through several latitudes. In many places the soil is rich; the air serene and temperate; and the country delightful; but in the province lying on the mouths of the Ganges the soil is marshy; the country flat; and covered with wood. Owing to these circumstances, the natives, and still more the Europeans, enjoy various degrees of health.

Calcutta, the chief settlement and capital of the English, is populous and extensive; and is situated above a hundred miles up the river Hughley. The houses of the residents are spacious, and beautiful; and made as cool as art can invent; the apartments being large and lofty, and almost every house having a portico of the extent of the front, supported on columns. In some of the best houses, this gallery is continued quite round the building, and is always of the same height. Such a construction is not only highly ornamental, exhibiting the appearance of splendid palaces, but is very salutary, on account of the free admission of air. Betwixt the columns of the portico, canvas hangings are fixed; which, by being occasionally moistened with water, render the suffocating air, in some measure, cool. The rest of the city is inhabited by Portuguese, Armenians, Banians, and black merchants. But the most considerable part of the natives live in streets, or squares, (usually called compounds) their habitations only consisting of small huts,

closely situated, and only defended from the inclemency of the weather by mats.

The new fort stands about a mile down the river, on flat, marshy ground. The barracks are roomy, cool, and elegant; and the whole is surrounded by strong fortifications. The land about this place is cleared for many miles; but, from its low situation, is very damp and wet in the rainy season.

About three miles south from Calcutta, there is a large collection of water, usually called the Salt-water Lake, which has a communication with the sea. This lake extends many miles up the country, and joining with other branches of the Ganges, it overflows in the rainy season. The sides of this large pool of water are very swampy; and in many places form fens, overgrown with sedges and reeds. As soon as the rains are over, the lake subsides, and leaves on the ground abundance of mud, slime, prawns, and other fish, which soon putrefy with the heat of the season, and occasion very noxious exhalations. The land to the northward does not afford a more favourable prospect, being low, swampy, and fit only for the cultivation of rice. The whole country, as far as our view can extend, appears flat, and no hills nor mountains are to be seen.

From Calcutta to Culpec, the usual station of our ships, the beach is muddy; the tides run high; and, on each side of the river, the land is uncultivated, and so much overgrown with trees, shrubs, and long grass, that it is one continued thicket; affording convenient haunts for tigers, and other wild animals. Several creeks here and there run off from the river; and some villages, the residences of the natives, are situated upon its banks; the

most desirable and healthful of which is Fulter, where the Dutch ships are stationed.

The village of Culpee is situated about a mile up a creek, in low marshy ground. The beach here, as well as the creek, is very muddy and slimy at low water. The land on each side is uncultivated, wet, and overgrown with impenetrable shrubs, and long grass. The whole country around, for a considerable extent, has the same unfavourable aspect; and in the rainy season is converted into a pool of stagnant water. In short, there is not in the whole world a more unhealthy situation than Culpee.

The remaining stations for ships that trade to Bengal, are Cogeree and Ingelee. The first of these is a village situated on a wide extended plain, which is tolerably dry, and free from underwood, and may therefore be reckoned healthy when compared with the unfavourable place we have just now described.

In the year 1768, although the Dutch ships which lay at Cogeree were not totally exempted from the general sickness of the season, yet diseases were attended with no great mortality amongst their seamen.

Ingelee is tolerably situated; the ships lie more out at sea; and the sickly season being over before they drop down here to take in the remainder of the cargo for Europe, the seamen of all nations enjoy good health; and those who have been weakened by preceding sickness recover sooner than at any of the places we have mentioned.

The rainy season at Bengal begins in June, and continues till October. During that time, scarcely a single day passes without deluges of rain, accompanied with

thunder and lightning. In August and September, the air is moist, intolerably sultry, and stifling, with seldom an intervening breeze: for there is not here, as in other parts of India, a regular succession of land and sea winds.

The dry and hot season is from April till June. But in May and June the air is particularly sultry, the winds hot, and few or no showers fall, unless accompanied with storms; at which time torrents of rain descend which cool the air. And it is observed by all who reside at Bengal, that if these storms be frequent, they render this period healthy: so that, even in this unwholesome country, the rains, which do not overflow the grounds and become stagnant, are conducive to health, and prevent diseases.

The cold season is from the end of November till March; and, during this period, there is not in the whole world a more delightful place than Calcutta.

It is not at all surprising that the situations we have mentioned should be annually visited with fatal and destructive diseases: for, independent of great heat, this would be the case in any other flat and marshy country.

As I had an opportunity of seeing the epidemic diseases which raged here in 1768-9, in all their different forms, I shall just mention the prevailing diseases through the different periods of the year, leaving the detail of symptoms and method of cure to another place.*

The remittent fever and dysentery are the fatal and prevailing complaints of the wet months, which begin in August and continue till November. During the beginning of the epidemic, the fever is attended with the greatest danger and malignity. It frequently carries off the patients in twelve hours; and, if it be not put a stop

* * Vide Part II.

to, generally proves fatal on the third or fourth day. In August, the remissions are very imperceptible; in October, they become more distinct: and, as the cold weather comes on, the fever becomes a regular intermittent. At that time too, the putrid dysentery begins to rage along with the fever. At the beginning, it is impossible to distinguish the two diseases, which are frequently combined: and, what is still worse, it often happens, when the fever is removed, and the patient in a convalescent state, he falls into the dysentery: his strength and spirits being sunk, after lingering out sometimes a few days, and sometimes weeks, death closes the scene, and puts an end to his miserable existence. Both the fever and flux, if obstinate, have an equal tendency to terminate in abdominal obstructions, particularly in fatal swellings, and suppurations of the liver.

These diseases were very fatal to many Europeans, particularly to new-comers in the year 1768. But I am informed, that, in the year 1770, when there was a scarcity of rice, it was computed, that about eighty thousand natives, and one thousand five hundred Europeans, died at Bengal. The streets were crowded with funerals; the river floated with dead carcases; and every place exhibited the most melancholy scenes of disease and death.*

During the sickly seasons at Bengal, the uncertainty of life is so great, that it frequently happens that one may leave a friend at night in perfect health who shall not survive the following day. There have been several melancholy instances of persons who have returned home in

* It has been a religious custom of the natives, from time immemorial, to bury their dead in the river Ganges. The deceased, as soon as their breath is out, are carried below high water mark, and suffered to lie there till the approach of the tides carry them off.

a state of perfect health from performing the last duties to a deceased friend, and have next day been numbered with the dead.

But the cool agreeable season, from December to March, is productive of no prevailing diseases. The complaints to be met with are in general the consequences, or remains of the diseases of the former period. The complaints which the Europeans are subject to in the dry months are the cholera, and diarrhœa. Fluxes and fevers are then seldom epidemic; and when they do happen, are not attended with much danger.

Chandernagore and Chinchura, the French and Dutch settlements, on the opposite side of the river Ganges, being situated farther up the country, where the soil is better, and free from marshes, are tolerably healthy, even during the rainy season. And when the same diseases happen, they are neither so prevalent; nor are they attended with so great malignity.

I now proceed to take a survey of the eastern coast of the Bay of Bengal.

From the mouth of the Ganges to Chitagong, the coast, which may be considered as a chain of small islands, is very low. Chitagong is a subordinate factory belonging to the English. It is healthier than Calcutta; however, all Europeans residing on the coast of Aracan are subject to fevers and fluxes, which are more frequent during and after the rains.

The coasts of Pegu and Tenasserim are only frequented by country vessels, the trade consisting of Tutenague, which they carry to the different parts of India. The mortality, which frequently happens among the European officers who trade there, shews the climate to be very unhealthy. The rains and sickly season happen in the

same months as at Bengal ; the diseases are the same, and attended with an equal degree of malignity.

The islands of the Negrais, lying near the coasts of Pegu, are low ; and in many places, covered with woods, from which arise great exhalations. The East-India company formerly endeavoured to make a settlement here, but were prevented by the natives ; which, in all probability, has saved the lives of many Europeans ; who would undoubtedly have fallen a sacrifice to the insalubrity of the climate.

The Malay coast is but little known. In coasting along, the aspect of the country is very unfavourable ; it appears low, woody, and uncultivated.

The Dutch settlement of Malacca, situated on the extremity of this peninsula, laying in 2 deg. 12 min. North, is pleasant and healthy. The situation of the town, and particularly of the fort, is elevated. The lands near the town, agreeably to the known industry of this nation, are well cultivated ; and the country around is interspersed with rising hills, and mountains. The air is not excessively hot, being refreshed almost every day with land and sea breezes ; and pleasant showers. Here the residents enjoy uninterrupted health and sound constitutions ; and, from the accounts of all the English ships who have wintered here, we may include it amongst the number of the most healthy European settlements in India.

Batavia, the chief settlement of the Dutch in India, lying in latitude 6: 10 South, is situated in a very large open Bay, on the North side of Java. The city is walled round, and has many canals cut through it, planted with rows of trees on each side. These canals extend into the country, which, for many miles, is flat, and laid out into large gardens, thickly planted with fruit trees.

Near the city there are a great number of villas, and the roads leading to them are also thickly planted with rows of trees. These improvements which have been effected by incredible industry, although beautiful to the eye, render this settlement peculiarly unhealthy. The canals being muddy, and containing stagnant water, produce noxious exhalations in the dry season; and, in the wet months, the rain overflowing their banks, a great quantity of slime and filth is left upon the ground, which corrupts the air.

But the inland country is hilly, and in many places temperate, especially from May till November. The insalubrity of the city might be, in a great measure, removed by erecting sluices to keep the water constantly running in the canals; and by cutting down the wood, so as to occasion a free circulation of air.

The rainy season is from November to May, during which time remittent, malignant continued fevers, and the dysentery rage with great fatality. Capt. Cook, in his first voyage, anchored here on the 3d of October, 1779, the whole crew, except Tupia, a native of Otaheite, being in the most perfect health. But in the course of nine days they experienced the fatal effects of the climate; and buried seven people at Batavia. On the 3d of December, the ship left the harbour. At that time the number of sick amounted to forty: and the rest of the ship's company were in very feeble condition. When the ship anchored at Prince's Island, in the straits of Sunda, the sickness increased, and they buried twenty-three persons more in the course of about six weeks.*

* "The seeds of the disease which we received at Batavia, began to appear with the most threatening symptoms in dysenteries and slow

The Grenville Indiaman, which touched at this island, in 1771, suffered equally from the malignity of the air. A few were taken on board, when the ship sailed from Batavia, ill of a malignant fever; which spread by contagion at sea, and carried off great numbers. I visited several in this ship, when she arrived at China, who were reduced to mere skeletons, by the duration of the fever and dysentery; both of which were most certainly propagated by contagion.

Those parts of Sumatra, lying immediately under the line, are continually subject to rain, and the ground near the shore is low and covered thick with trees and underwood. The heat being intense, noisome fogs arise, which corrupt the air, and render this country fatal to foreigners. Even in the more elevated and hilly coasts, on the south-west of the island, which, at a distance, exhibits a more favourable situation, the low grounds are covered with impenetrable woods and long grass.

The land of North Island, which lies on this coast near the beginning of the Straights of Sunda, appears, at a distance, finely variegated: but at the place where the wood and water are to be got, it is low and covered with impenetrable mangroves, and infested with a variety of

fevers, lest the water, which we had taken in at Prince's Island, should have any share in our sickness, we purified it with lime, and we washed all parts of the ship between decks with vinegar, as a remedy against infection." Mr Banks, now Sir Joseph Banks, was among the number of the sick, and, for some time, there was no hope of his life. "We were very soon in a most deplorable situation; the ship was nothing better than an hospital, in which those who were able to go about, were too few to attend the sick, and we had almost every night a body to commit to the sea."

Cook's Voyage by Hawksworth.

insects.—It is here that most of the East-India ships take in wood for their homeward voyage. A Danish ship, in 1768, anchored at this island, and sent twelve of her people on shore to fill water, where they only remained two nights. Every one of them were seized with a fever, of which none recovered : but, although, the ship went out to sea, none, except the twelve who slept on shore, were attacked with the complaint.

The improvements which are every day taking place at Bencoolen will soon render that settlement healthy. The residents there having totally relinquished the old town, which was wet and low ; and residing at Fort Marlborough, on a drier and more elevated situation, are not so subject to sickness in the rainy months as formerly ; and the diseases which appear are of a much milder nature. Upon the whole, the insalubrity of Sumatra seems to be owing to want of culture. In many places the soil is luxuriant ; and, in particular on the north-east end, the country is diversified with high grounds, hills, and mountains.

The uncultivated parts of the large island of Borneo is subject to the same intemperature of climate and diseases, as Sumatra : and this too is the case of the Celebes, the Molucca, or Spice Islands.

The Spanish settlement of Manilla, on the island of Luconia, which is the chief of all the Philippines, has its unhealthy seasons. The land for many miles round this beautiful city is low. In June and July, the humidity of the air is great, and the heat of the sun is intense, which raises noxious exhalations. In these months fevers and fluxes are frequent, some years carrying off a great number of the inhabitants. No country, however, in the world is more agreeable during the rest of the year : the

climate is temperate : the fields are covered with perpetual verdure ; and produce all the varieties of tropical fruits.

SECT. III.

CANTON, WAMPOA, AND MACAO.

THE whole empire of China is represented to be extremely delightful ; the soil rich, the air pure ; and the industry of the inhabitants astonishing. As it produces every luxury and necessary of life, it is justly esteemed one of the most fertile countries in the world. As the Chinese prohibit emigration, and seldom or never engage in war, their empire is extremely populous. Every river maintains a proportion of inhabitants adequate to the land ; whose families live continually in boats, without having any other place of residence. Their number of people lays them under the necessity of carrying industry to the greatest height ; for otherwise their country, fertile as it naturally is, would be insufficient to maintain the inhabitants. Every inch of land is cultivated ; no forests, nor woods, nor even a single tree, are suffered to obstruct the labours of the husbandman. Canals are cut out every where to water the fields ; and marshes are manured for the cultivation of rice. By these means, health and plenty are, in a great measure, the portion of its inhabitants through all the seasons of the year.

The only terrible and fatal diseases to which they seem to be subject are the small-pox, and leprosy, two of the most nauseous distempers which afflict the human race.

But, as it is not my intention to dwell upon the diseases of the natives, a subject to which perhaps, no European will ever be equal, I shall confine my observations to the port of Canton, the only part in the Chinese empire frequented by Europeans.

The usual station of all European ships in Canton river is at Wampoa, a village, situated about fourteen or sixteen miles below the city of Canton. On one side, the land is low, marshy, and covered with water, forming swamps, fit only for the cultivation of rice. The extent of these swamps are considerable: the tides rise very high and overflow great part of them; but the intersection of the river renders them more pure than they would otherwise be; and consequently the air is much healthier than one could well expect from the unfavourable aspect.

On the opposite side, the French and Danes Islands are formed by the intersection of this large river. The land on Danes Island is high, and affords an excellent prospect of the country around, which consists of a variety of other islands agreeably diversified with rising hills, pleasant verdant valleys, with numbers of fine villages.

The city of Canton is built on a wide extended plain, and is very large and populous. Here the government allowed the English, Dutch, French, Danes, and Swedes, separate factories on the banks of the river. The city, though paved, is very wet in rainy weather; and the water makes its way under the factories of the different nations every tide. The houses are built with bricks; the apartments are in general small and not very lofty; and the ground stories are very damp. When the business of the season is over, the supercargoes remove to Macao, a Portuguese island, subject to the Chinese government. The city of Macao is situated on a rising

ground ; the whole island is dry, rocky, and barren ; it is, however plentifully supplied with provisions by the Chinese ; and though the air is very sultry, yet it is tolerably healthy.

The heat of the places just mentioned as well as of all the southern parts of China, is excessive during the summer months, particularly in June, July, and August. In September and October, the weather is still sultry in the day-time, but cold and chilly with north-easterly winds, at nights. December, January, and February, are the cold months ; and during this time the vicissitudes of the weather are more quick than in any other part of the world. When the winds are northerly, the weather is cold, and the thermometer at 46° , upon a change of the wind to the south ; it is next day up at 60° or 70° . People who reside here are always at a loss, with regard to their clothing ; one day finding a silk coat sufficient, and the next, upon a sudden change of the wind finding it necessary to wear a flannel waistcoat.

In July and August, the climate is excessively sultry ; and the seamen living at Wampoa are subject to dangerous remittent or continued fevers, which are no ways different from the epidemics of other warm climates. In November, these fevers change into regular intermittents, which admit of an easy cure by the bark, and are seldom or never attended with great danger. During the above period fluxes are frequent, and seem to be the most prevailing endemic : and although they are not so fatal here as at Bengal, yet if they be neglected at first, they become frequently dangerous, and always very troublesome ; often baffling the power of every medicine, till such time as a change of climate is produced by setting out to sea.

In 1771 when twenty-seven European ships were

stationed at Wampoa, these diseases were very universal, and carried off numbers. In November, about a third of our people laboured under double tertians, regular agues, and the dysentery. The same diseases prevailed equally in the other ships; and unless the bark was given early in the fevers, and timely evacuation made in the flux, there was little chance of the patient's recovery. The fever and flux were frequently combined, and often changed into one another. In some cases which I have seen, where the patients were neglected at first, the diseases proved fatal as early as the sixth day; and in others, where the period was longer, the greatest symptoms of putrefaction appeared.

Upon the whole, the port of Canton, is by no means so healthy as it is generally represented. The comparative degree of health which Europeans enjoy here has been ascertained from the instances of the supercargoes, which is, however, a very erroneous standard. The generous and regular way in which these gentlemen live, for the most part, exempts them from diseases, and being but few in number, no great mortality can take place amongst them. But seamen, who never observe much regularity in their way of living; who work hard in the day-time; are but badly clothed; and not provided against the damps and cold north-easterly winds at nights, seldom fail to be afflicted with the diseases already mentioned. Even the factors of the different nations, who reside here for any considerable time, experience all the inconveniences peculiar to every sultry climate: florid health is a stranger to their countenances; their constitutions are soon weakened and enfeebled; and they become subject to habitual fluxes and other complaints the usual consequences of too great relaxation.

But from this I would not be understood to infer that China is peculiarly fatal to Europeans ; on the contrary, there are many circumstances which render it more salutary than most of the settlements in India. The usual provisions and refreshments to be met with here are much superior to what can be got in any of the ports of India, and are not exceeded even by England itself. The diseases, however, are of the same nature with those of other warm climates ; and when many ships are at this place, they carry off numbers.

CHAP. V.

GENERAL OBSERVATIONS ON THE MANNER, IN WHICH EUROPEANS LIVE
IN THE EAST INDIES.

HAVING given some account of the principal settlements of Europeans in Asia, I shall conclude with some short remarks, on their manner of living, in this part of the world.

Europeans live much in the same way as they do in their own countries; except that they carry luxury to a greater height. At Bengal, and on the coasts of Malabar, and Coromandel, there is plenty of rice, all kinds of tropical fruit, greens, roots and meat, and likewise fish. The poultry is good: the beef is very indifferent; and the seamen, who eat freely of it, are subject to the cholera morbus and diarrhœa.

The common bread, made of wheaten flour, is very good, and well fermented. The usual drink is arrack punch. But amongst people of fashion, wine and water, cyder, and country beer* are the usual diluters of their meals. They are plentifully supplied with preserved fruits, pickles, beer, and porter, from England; and they have in general all varieties of wine. A generous, but moderate use of wine is conducive to health, and is useful in preventing diseases; and it is, indeed, generally observed all over India, that the people whose circumstances enable them to drink claret, enjoy the greatest immunity from sickness. Great errors seem to be committed in drinking too much, and in eating luxurious meals of animal food, served up with pickles, rich sauces,

* Country beer is made by mixing one part Dorchester beer, or porter, with two or more parts of water, to which a little ginger and a sufficient quantity of sugar are added; a very strong fermentation is soon renewed, and in a few hours the beer is very brisk and exceedingly palatable.

and dressed in such a manner as to encourage too much repletion : for it is remarkable, that in warm climates so long as there is the least remains of health, in consequence of the evacuations being more profuse ; and the constitution demanding a greater supply, the appetite is encreased.

Rice, vegetables, and spiceries are the common articles of diet of the natives in all warm climates. In imitation of this, cory * and rice is a standing dish in all European families, which, though complicated, is, perhaps, the most salutary diet ; for in this way, a sufficient quantity of animal and vegetable food can be taken with safety, to satisfy the most craving appetite.

After dinner, it is the usual custom to go to bed for some hours. This almost every person thought a salutary practice. It, however, did not agree with my constitution, as it always was succeeded by heaviness and languor.

The men dress lightly, and, when in the house, except upon visits of ceremony, sit in their waistcoats with sleeves. The ladies attire themselves elegantly ; but incumber themselves with stays, and decorate their heads as in Europe. The usual vehicle, for carrying people of fashion abroad, is a palanquin. In the morning and afternoon they often ride out on horseback. In the cool months, at Calcutta, when I was there, the usual diversion gentlemen engaged in was cricket in the afternoon : but, even at this time, it seemed too violent an exercise for the climate.

* The principal ingredients of cory are cayenne pepper, ginger, and turmeric. Fowls, prawns, and other fish, are stewed in a proper quantity of this powder, to which a few shallots are added, and the whole agreeably soured with lime-juice. The stew is served up and eat with abundance of rice.

PART II.

PRACTICAL OBSERVATIONS

ON THE

DISEASES

WHICH PREVAIL IN

LONG VOYAGES TO HOT COUNTRIES, &c.

HAVING, in the former part, given a general account of the prevalent diseases in long voyages to hot countries, and in various parts of Asia, I shall in this proceed to arrange them, and afterwards offer practical observations on each distemper.

CHAP. I.

OF THE ARRANGEMENT OF DISEASES AND DIVISION OF FEVERS.

SECT. I.

GENERAL ARRANGEMENT OF THE DISEASES WHICH PREVAIL IN LONG VOYAGES TO HOT CLIMATES, AND IN VARIOUS PLACES IN THE EAST INDIES.

IN arranging the diseases, I shall first consider those, which usually occur at sea ; and then enumerate the more fatal epidemics, which prevail on shore, and are affected by land exhalations.

The diseases, to be met with in voyages to the East Indies, are but few in number, and may be properly arranged under the following heads :

1st. Such diseases as are occasioned by heat alone.

2d. Such as are occasioned by heat united with moisture.

3d. Such as are the consequences of cold united with moisture.

The diseases, at sea, arising merely from heat are very inconsiderable. If the voyages be favourable, and no long continued calms take place, the crew in general enjoy a good state of health. The common effects, which even immoderate heat has upon the constitution, are, a greater secretion of bile ; rarefaction of the fluids ; and relaxation of the solids : hence arise loss of appetite, nausea, acceleration of the pulse, and slight fevers, upon first getting into a warm climate. Heat alone, therefore, can only be considered as a remote cause of sickness,

which will happen when it is succeeded by a humid, stagnant, atmosphere.

The diseases occasioned at sea, by heat united with moisture, are fevers, or fluxes. These complaints often make their appearance in latitudes near the equator; where the air is moist, wet, and sultry, and where, on account of calms, noxious exhalations arise from the ocean. But if a gentle breeze spring up, the suffocating vapour is dispelled, and the languor, and sickness, which are certain presages of disease, are wonderfully removed; and any ailment rendered trivial which may occur.

The most common, and dangerous epidemic, arising at sea, from cold united with moisture, is the scurvy; which seldom or never appears, in voyages to India, till the ships arrive, in the stormy latitudes, off the Cape of Good Hope. If the weather, however, be tolerably dry, and the passage quick into a more temperate climate, the disease, if it makes its appearance, is not fatal. But on the contrary, if the ships be long detained by unfavourable winds in stormy weather; if large seas continually wash the decks; if the crews be fatigued and wet upon duty; and have no place to retire to, but a dirty berth, and wet hammock, where they must breathe a polluted air; the distemper never fails to rage with malignity. In such a state of the weather, even the officers, who live better, and have changes of dry cloaths, at last become affected, and suffer more or less by the disease.

I come now to consider the most prevalent land diseases in the East Indies, which being influenced by the weather, may be divided with most propriety, into those which appear in the dry, and those which prevail in the wet season.

The diseases of the dry season, are mild fluxes from acrid bile, cholera morbus; bilious cholic; and inflammation and obstruction of the liver.

The diseases which prevail in the wet season, are fevers, and dysenteries; which are malignant in proportion to the heat, and humidity of the air; and to the noxious exhalations from marshy, and uncultivated tracts of country.

Thus far having arranged the diseases, as they seem to depend upon the weather, situation, and season, it will appear, that the most destructive complaints, in the East Indies, are fevers; cholera morbus, dry belly-ach, dysentery, and hepatitis; and at sea, the scurvy. These shall be treated of in their proper places.

But as fevers are the most frequent and fatal of all diseases, it remains to consider, in a cursory way, the usual denominations, by which they have been distinguished; and to examine the real difference which obtains amongst the genera into which they have been divided.

SECT. II.

OF THE DIVISION AND DIFFERENCE OF FEVERS.

FEVERS have been divided into many GENERA, and various appellations have been given to them both by the ancients and moderns, derived from the time of their duration, from some remarkable predominant symptom, from the state of the fluids, and from various other circumstances.* But unfortunately, the many names to

* Hence amongst the ancients the names of ephemera; synochus; typhus; lypyria; assodes; causus; synochus putris; synochus imputris, &c. And amongst the moderns, inflammatory; nervous; putrid; bilious; petechial; military; jail; hospital; ship; yellow fevers &c.

be found amongst authors, not only perplex the unexperienced, but answer no real advantage in practice.

After many years careful attention to the symptoms and nature of fevers, as they have occurred in practice, in different climates; and after reading many authors upon the subject, I am thoroughly convinced, that, although many *varieties* happen according to difference of constitution; season; situation; and climate; yet, in every part of the world, the disease is essentially the same: or, in other words, consists only of one GENUS; and that the only *species* that can be ascertained, are the *intermittent*, *remittent* and *continued*.

In support of this opinion,* the intelligent reader is referred to the consideration of the essential symptoms of these species of fever. The continued fever, he will find, does not differ more from the remittent, than the remittent from the intermittent type; and that their frequent changes into each other, and perhaps again to their original form, prove them to be the same GENUS. Thus the intermittent fever will, in some cases, assume the continued form: the remittent, for several days, will run on with unabated violence; and, often, after the most sensible remissions, terminate again in a continued fever. Thus also, every continued fever has alleviations and exacerbations, and therefore in a strict sense may be considered as a remittent.

Continued fevers have been divided by modern medical authors into three GENERA, the *inflammatory*, *nervous*, and *putrid*: and many physicians, fond of multi-

* For a more particular account of the reasons in support of fevers being essentially the same, see the author's *Observations on fevers*, &c. published in 1780.

plying names, have subdivided each of these GENERA, into many *species* and varieties.

If we examine these supposed GENERA, they will be found only to express different states of fever. The inflammatory fever, for example, is defined to consist in intense heat, frequent, strong, hard, and full pulse, with high coloured urine. Many fevers, it must be granted, in their incipient state, are attended with these symptoms; which, however, prevail more in the paroxysms of intermittent, and remittent fevers, than in those of the continued type. Even the depressing powers of contagion do not always guard against symptoms of strong action in the arterial system, which, in the beginning, are allowed to attend nervous, putrid, and jail fevers* as they have been termed.

With regard to the nervous fever, every symptom which characterizes it, attends remittents in hot climates: and as to the putrid, although in some rare instances the fluids have, in the beginning, appeared in a dissolved state; yet a tendency to putrescency is an effect, and not a cause of fever; and equally attends intermittent, remittent, and continued fevers. There appears great impropriety, therefore, in confining the terms *inflammatory*,† *nervous*, and *putrid*, to continued fevers; and still more absurdity in establishing them as distinct GENERA.

In other diseases were we to form distinct GENERA, from the different states of the fluids, and other attendant

* See Gillchrist upon the nervous fever; Pringle on the jail fever, and Huxham on the putrid fever.

† The inflammatory fever, I formerly observed, in my treatise on fevers published in 1780, I never had seen as an idiopathic disease. Since that period I have not met with an instance of it: and all authors now allow it to be a rare occurrence.

circumstances, as has been done in continued fevers, we should greatly multiply distempers, which are essentially the same. The small-pox for example, being in some patients attended with strong action of the vessels; in others with symptoms of debility and nervous distress; in others with a putrescent state of the fluids; and in many with bilious vomiting; might with equal propriety be divided into distinct GENERA; under the titles of *inflammatory*, *nervous*, *putrid*, and *bilious*: but every physician knows that the distemper proceeds from the same specific contagion, and that these circumstances, attendant on the fever, express no generic difference.

But fevers are not more alike in their essential symptoms, and their tendency to change their forms, than in the causes which produce them. They are all the offspring of heat and moisture; of exhalations from corrupted animal or vegetable substances; of confined air loaded with human effluvia: or they sometimes proceed from some internal degeneration of the habit. They also are all apt to become contagious; and therefore a person, labouring under fever, has the power of communicating the same distemper to one in health, by morbid effluvia or emanations issuing from his body.

This contagious power, inherent in fevers, they however possess in very different degrees, according to the different modifications of their remote causes. Thus regular intermittents, which derive their origin from the purer marshy exhalations, are only slightly contagious*,

* Agues possess the contagious power in so small a degree, that their influence in this respect has been denied by almost all authors. Dr. Cleghorn however, whose judgment and accuracy are indisputable, found them infectious in the island of Minorca. "Tertian fevers

whereas remittents, originating from corrupted exhalavers of various forms appear among people of all ages, and spreading from one to another, by *contagion* they continue to increase till about the time of the autumnal equinox, when they rage with the utmost fury amongst persons of all ranks, whether natives or foreigners. These fevers have as good a right to be called contagious as the measles, small pox, or any other disease; for although in that season, there is certainly a peculiar disposition in the air, to affect numbers in the same way; yet those, who are much conversant amongst the sick, are most liable to catch the distemper.” *Observ. on the epidemical diseases of Minorca.* Third edition, page 132.

So far as my own observations go, I must subscribe to Dr. Cleghorn’s opinion. I have frequently seen agues appear, when there was no reason to impute the cause to marshy effluvia; but merely to contagion. The following are a few of the many instances, which might be adduced in support of this opinion. Several years ago I attended a lady in a palsy, who lived in a town, where no ague prevailed, and was confined to a three pair of stairs room; yet nevertheless, she took a tertian, where no occasional cause could be imputed except contagion.

A few years after, a gentleman ill of the palsy, as also his servant maid, were attacked with intermittents, and no other cause could be assigned, except the visit of another maid servant, who lived in the country, and was ill of an ague.

A person ill of an ague visited a child, in a high and dry situation; and when the feverish state began to subside, had much intercourse with it. The child in a few days took the disease.

An adult person whose habits, and manner of life, made him by no means subject to an intermittent, called upon a friend who was sweating profusely in the paroxysm of a tertian. The effluvia arising from the patient’s body, he said, he received by inspiration; the scent of which he never afterwards could get rid of. In a few days he was seized with an intermittent, with severe quotidian paroxysms, attended with delirium, and great irritability of stomach. In the third paroxysm I visited him; and he then appeared to be in so great danger, that every measure was instantly made use of to break the force of the next fit; which succeeded; but he continued for some weeks extremely weak.

Since I was elected physician to the Newcastle Infirmary, in May,

tions after hot summers, or in warm climates*, are very contagious; and from this cause often assume a continu-

1788, I have had six instances of agues, being communicated from one person to another by contagion. And the same thing has happened to some of the other medical gentlemen in the hospital. The infirmary is situated in a dry, airy, situation; and agues have not been known to happen in the house; except when other patients have been admitted labouring under the disease. In the cases I have alluded to, the persons infected with the ague, were in the high wards; and lay in beds contiguous to patients who communicated the distemper.

The remittent fever, which proved so destructive to the imperial army in Hungary, spread by contagion; became exceedingly mortal, and was propagated over Germany, and great part of Europe. See *Sennertus and Ruland de Morbo Hungarico*.

But to apply more particularly to the object of this treatise, a single doubt cannot be entertained of the infectious nature of the Johanna and Mohilla fever, and of that which proved so fatal to Captain Cook's ship, and the Grenville East Indianan [see page 91]. To these, I shall only add a short account of the contagious fever of Senegal, in 1778.

The remittent fever, there, generally happens during the rainy season: but when the rains are heavy and overflow the island, the fever assumes the malignant continued form. Dr. Schotte, a German physician, supposes the contagion was brought from Goree, a French garrison, by some black messengers; but this does not seem to be clearly ascertained. The distemper, however, appeared in a soldier on the fourth of August, who died on the third day of the fever. The orderly man of the hospital was seized on the sixth with the same disease, and died on the ninth of August. One of the venereal patients, who still remained at the hospital, was taken ill of the same fever, and died in a few days. Some of the soldiers in the fort having access to the hospital, to visit their sick comrades, took the contagion, and spread it through the whole garrison.

Out of the number of ninety-two white people who were on the island, when it broke out, only thirty-three were left, when the French invested it, on the 28th of January 1779; and eight of these were hardly able to walk. Three of the latter died on their passage to

ed form : and when this happens, these remittents differ in no respect from that variety of continued fever, which is propagated in camps ; jails ; hospitals ; ships ; and in the confined habitations of the poor.

France, as prisoners of war ; and in two more of them, the probable fatality of lingering fluxes, in which the disease terminated, was anticipated by their being drowned on the bar of Senegal, from the over-setting of the boat which conveyed them. The symptoms, attending the disease, were so horrid and dreadful, that it seemed almost impossible that any one could have a chance of recovering, and so very contagious, that it spread over the island with amazing rapidity. Most patients died on the fourth or fifth day, a few were carried off suddenly, and some others, not before the sixth or seventh day. Those who survived the seventh day, either recovered, or fell into lingering dysenteries, attended with obstructions of the liver, which sometimes terminated in suppuration, and of which death was sooner or later the consequence. A constant and uninterrupted fever, attended the disease, from the beginning to the end in all of them who died ; and in some who recovered no *apyrexia* took place before the seventh day or later.

The most distinguishing symptoms which attended this fever in the beginning, were nausea and sickness at stomach, great head-ach, pain in the back, vomiting of bile ; and sometimes great quantities of black matter resembling coffee grounds. The eyes were red and shining, and seemed to project from their orbits. As the disease advanced a delirium was added, the patients complained of burning heat at the stomach, attended with sickness and unquenchable thirst. A putrid diarrhoea came on ; slight hemorrhages made their appearance ; to which were added petechiæ ; and vibices appeared a few minutes before death.

The author gives this fever the name of *synochus atrabiliosa* : but it appears to be precisely a remittent fever of a malignant nature ; and indeed he confesses, that it only differs in the beginning, from the fever which is called *bilious*, or from that which goes by the name of *yellow*, by the severity of its symptoms. The name of *synochus* here, it is to be feared, influenced the practice, as it always supposes the propriety of bleeding in the beginning. See Schotte on the *synochus atrabiliosa*, a contagious fever which raged at Senegal in 1773, and proved fatal to the greatest part of the Europeans, and to a number of the natives.

With regard to continued fevers, whether they at first appear in their own proper form, or degenerate from the remittent type, I am convinced that when they become prevalent, in any town; village; or even in a single family; they are always contagious; and if precautions are not used they spread and become general, from being possessed of this baneful influence. Their constant appearance in the dirty habitations of the poor; and the total immunity of people who live well, and observe cleanliness, except, when falling in with accidental contagion, are the strongest proofs that they originate from, and are propagated by infection. For eighteen years past, I have attended minutely to the rise, and its progress of fevers in Newcastle and its vicinity; and, where I have been concerned, have been able to trace the infection in most cases. For this purpose I have, for some years past, had a register kept, at the Newcastle Dispensary, upon a plan similar to that used by my ingenious friend Dr. Haygarth, of Chester, for tracing the progress of variolous infection: and as it may be useful for those who will give themselves the trouble of making observations on febrile infection, especially in large towns, a specimen of the register will be annexed to this volume.

CHAP. II.

OBSERVATIONS ON FEVERS.

HAVING made some remarks on the division and difference of fevers, I shall now proceed to offer practical observations on them. But the remittent being the most frequent form in hot climates, I shall treat of it more fully, and confine my remarks on fevers of the continued and intermittent type within a very narrow compass.

SECT. I.

OF THE REMITTENT FEVER.

THE remittent fever may occur at any time in hot climates, but seldom rages epidemically, unless in close, moist, and sultry weather. In treating of this disease, I shall first give a history of its symptoms, as it appears at sea, when it is not affected by exhalations from the land.

The fever generally attacks with lassitude, rigours, sometimes only with a chiliness, pains of the back and bones. These symptoms are succeeded by sickness at stomach, great heat, thirst, and pains above the eyebrows. The pulse, though soft, becomes very quick and full; the countenance is flushed; the head aches violently; the patient is troubled with great restlessness, anxiety, and oppression; and in the height of the paroxysm vomits abundance of bile. The crisis of the fit is generally by sweat; and the patient enjoys a short lucid interval, during which the pulse seldom returns to its natural

state ; and almost all complain of a bitter taste in the mouth, giddiness, head-ach, and prostration of strength. In a few hours, the feverish accession returns, which is only known by an aggravation of all the symptoms ; and is carried off by a sweat, as the former paroxysm ; or sometimes by an evacuation of bile.

If the disease be neglected, the remissions grow more indistinct ; and, sooner or later, it acquires a continued form, accompanied with many of the following symptoms : the tongue, which before was only white and furred, becomes dry and black ; the teeth and lips are covered with a tenacious slime ; and sometimes aphthæ appear in the mouth, and throat. The heat, head-ach, and inquietude are greater ; the eyes either become dull and heavy, or wild and staring ; and the patient falls into a coma, or delirium, attended with tremors and twitching of the tendons. As the strength sinks, the pulse becomes very small and fluttering, and the heat of the skin is changed into a cold clammy moisture. If there have been no symptoms of putrefaction before this, they often now appear : these symptoms, however, do not always take place ; for I have seen the patient carried off without any evident marks of dissolution in the blood, even when the disease has continued several weeks.

Sometimes, instead of the paroxysms already mentioned, the patient, at first, was only indisposed with giddiness, head-ach, and low spirits : and, although still able to go about, was always worse at night. When the attack was in this form, I have generally observed the fever in its course to be attended with greater danger ; less distinct remissions ; and more evident symptoms of putrefaction.

These are the common characteristic symptoms of the

fever, both at sea and in favourable land situations. But in low, woody, and unperflated countries ; where, besides intense heat, there is likewise great moisture, and more especially if there be noxious effluvia from marshes, or stagnant waters, the disease is more rapid, universal and fatal. As an instance of the most malignant fever which I have ever seen in any part of the East Indies, I shall here give a description of the marsh fever which raged at Bengal in the year 1768.

This fever attacked in various ways ; but commonly began with rigours ; pain and sickness at stomach ; vomiting ; head-ach ; oppression on the præcordia ; and great dejection of spirits. Sometimes, without any previous indisposition, the patients fell down in a deliquium ; during the continuance of which the countenance was very pale and gloomy. As they began to recover from the fit, they expressed the pain they suffered by applying their hands to the stomach, or head : and, after vomiting a considerable quantity of bile, they soon returned to their senses. Sometimes the attack was so sudden, and attended with such excruciating pain at the stomach, and so great a degree of timidity and faintness, that I have been obliged to give an opiate immediately.

In whatever form the disease appeared at first, the pulse was small, feeble, and quick ; the pain of the stomach increased ; and the vomiting continued. As the paroxysm advanced, the countenance became flushed, and the pulse very quick and full. The eyes were red, the tongue furred, the thirst intense, and the head-ach exceedingly violent. A continuance of these symptoms soon brought on a delirium, in which the patients were very unmanageable ; but a profuse sweat breaking out in twelve or thirteen hours, generally mitigated all the symptoms.

In the remissions, the pulse, which before was frequently 130 fell to 90: the patient returned to his senses; but complained of great debility; sickness at the stomach; and a bitter taste in the mouth. This interval, which was very short, was succeeded by another paroxysm, in which all the former symptoms were much aggravated, particularly the thirst; delirium; pain at the stomach; and vomiting of bile. The breath and sweats, even so early as this, sometimes began to be offensive.

If the disease was neglected, in the beginning, the remissions now totally disappeared; and the skin became moist and clammy. The pulse was small and irregular; the tongue black, and crusted; and the pain at the stomach, and vomiting of bile, became more violent.

When matters arrived to this pass, all the excretions, but especially the stools, were very offensive, and ran off involuntarily: and the patients now, instead of being highly delirious, laboured under a coma, with interrupted ravings. Convulsive twitching of the tendons, tremors, and hiccup were added: the extremities grew cold and were covered with livid vibices; and the body for several hours before death, very frequently emitted a cadaverous smell.

The appearance of the urine, in fevers of warm climates, is not much to be depended upon. In the beginning of the paroxysm, it is pale; at the height, of a higher colour; but seldom or never deposits any sediment.

If the fever was neglected at first, it generally proved fatal betwixt the third* and seventh days. In some cases, indeed, where the exacerbatations were not severe,

* I was informed by a surgeon, who resided at Calcutta, that there were many instances of patients being carried off highly delirious in the first fit; but that he still lost more in the third paroxysm. His

it was protracted to the fifteenth, and sometimes to the twentieth day. But consequential diseases of the liver, terminating in suppuration, and the dysentery, attacking patients in the convalescent state, proved more fatal than the original disease.

CAUSES OF THE REMITTENT FEVER.

Moist air after long continued heat, and exhalation from marshes, or damp grounds, are the most common remote causes of the remittent fever. But besides these, I shall mention some others which predisposed to the disease, and seemed to have a powerful effect in rendering it more dangerous. These are principally too great inanition; too great repletion from a diet of animal food; fatigue in the heat of the sun; and the dejecting passions of the mind.

The three first predisposing causes are so evident, that none can doubt their powerful influence: nor did it escape the eyes of the most common observers at Bengal, that those who had been much reduced by evacuations, particularly by the use of mercury, great eaters of animal food, and those who exhausted themselves by fatigue in the heat of the sun, were most liable to fevers; and, when attacked, had the worst chance of recovery.

But of all the predisposing causes none seemed so powerful as the debilitating passions of the mind, such as disappointment, grief, and fear. It is owing to this circumstance, that fevers and fluxes are so very fatal to

practice was to exhibit an emetic at first; and afterwards to endeavour to bring the fever to remit, by antimonials, and saline draughts. Here, the danger in the first paroxysm, seems to have been too great to admit of a cure by the most powerful medicines; but the fatality, in the third, might certainly have been obviated by an early exhibition of the bark.

young adventurers, who annually emigrate in expectation of acquiring riches. Upon their arrival, finding all their delusive hopes suddenly dissipated, they become low-spirited; take the infection; and are carried off in an instant; whilst others as little inured to the climate, and exposed to the same remote causes of disease, but who have better prospects, either escape the sickness, or when attacked, have it in a less malignant form.

But of all the debilitating passions, none is attended with so powerful, and so sudden an influence as fear: for I have observed, that when a dangerous fever has been prevalent, that an alarm has often occasioned almost an instant attack, when the person has been exposed to the remote cause of the disease. And it is perhaps easier upon this, than on any other principle, to account for the sudden deaths, which frequently happened to some who attended the funeral of a deceased friend at Bengal; for if the sickness, as some have imagined, had been merely occasioned by exhalations from the marshy burial grounds, or putrid *miasmata* from the adjoining graves, the grave-diggers would have been more subject to an attack than the attendants on the funeral. This, however, was not the case; for it generally happened that the timorous and humane suffered, whilst the hard-hearted and callous escaped.

Although the remittent fever, at first, seems only to be produced by moist air, or exhalations from marshy grounds, yet there is no doubt that the disease is afterwards often propagated by contagion. This was very evident in the fever of Bengal. At first only two or three of our people were attacked, who had worked hard in the heat of the sun: but in a fortnight the fever and flux became so general, that few were capable of doing duty.

Nor did any escape altogether, except the officers, and quarter-masters, who had no communication with the sick, and the cooks who worked in the galley amongst the smoke.

Whilst this was the case on board the *Talbot*, the *Dutton* was burying her people every day ; and, at the same time, the *Queen* and *Salisbury*, two other of the company's ships, although at no great distance, and anchored nearer the shore, enjoyed almost a total immunity from sickness. Another circumstance which plainly evinced the influence of contagion, was the great mortality amongst the visitors, and attendants on the sick. Nor was the fever less infectious at *Calcutta*, where the patients lay in large rooms : for merely from being, for a short time, employed about the sick, I often experienced all the symptoms of an attack, and was seized with the fever, although I used some means of prevention.

Having taken notice of the principal remote and predisposing causes of the remittent fever, it may be expected that I should advance something relative to the proximate cause ; and attempt to explain how the various symptoms are produced. But here I confess my total ignorance. Were I, however, to risk an opinion, with respect to the proximate cause of fever in general, I would say that it neither depends upon obstruction, lentor, bile, spasm, or any other partial cause : but that the contagion of fever, whether arising from marsh exhalations, human effluvia, or any other source, is a poison, which, when received into the system, produces all the symptoms that follow ; in the same manner, as the contagion of small-pox or measles produces their respective febrile states. I would also farther add, that this poison, in proportion to its degree of virulence, or the difference

of constitution to resist it, more or less exhausts the vital powers, and that it occasions death, sometimes by inducing debility, and sometimes a corruption of the fluids, but still more especially by occasioning congestion, or *engorgement* of the organs essentially necessary to life. *

OBSERVATIONS ON PARTICULAR REMEDIES USED IN FEVERS.

BEFORE I proceed to the method of cure, I shall offer some observations on particular medicines, which I have used in this, as well as in other forms of fever, appretiating their merit, and the dependence which should be placed upon them by experience alone.

VENESECTION. This evacuation has been recommended almost universally by physicians, to remove fulness of the vessels, to reduce the fever, and to bring it to regular remissions. In some cases, where the consti-

* For many years past I have attended to the causes of death in fevers, and can, with confidence, affirm, except in some rare cases, where the powers of life seemed to be overwhelmed at once, I have seen few or none die of mere debility, or of putrescency alone. By proper treatment these causes of death may be always obviated. But determinations to the viscera are the most frequent causes of death in fevers; either from some local weakness having previously subsisted, on which the force of the fever falls, or the virulence of the contagion being of so debilitating a nature, as to occasion an unequal distribution of the blood, to those organs where the vessels are peculiarly delicate, or the circulation languid. Hence congestion in the brain, in the lungs, and abdominal viscera. Authors of great eminence alledge that such determinations depend upon the *phlogistic diathesis*; but when I find pleurisy and rheumatism are never attended with local determination to the head, unless great debility be brought on, I can by no means subscribe to their opinion. Original fevers, indeed, attended with strong action of the vessels, are always the safest; and, unless debilitating plans of cure be carried too far, seldom terminate unfavourably.

tution is vigorous, and the infection mild, perhaps taking away some blood in the beginning of fevers may not be attended with much danger. I have too much respect indeed, for several eminent authors, after making all proper allowances for their theoretic ideas of the danger from the *phlogistic diathesis*, to believe they would so strongly enjoin bleeding, had they not often found it advantageous, at least harmless. Guided by such authorities, in the beginning of my practice, I was frequently induced to try the effects of bleeding. In fevers which occurred upon first entering into hot climates it seemed to do no harm, as they were generally of so mild a nature as to require little more to remove them than cleansing the bowels, and keeping up a moderate perspiration. But, after a short continuance of hot weather, even although bleeding seemed to be indicated by great heat, thirst, head-ach, and oppressed pulse, I seldom or never saw it answer any good purpose.

Encouraged by the similarity of the Bengal fever and that of the marshes described by Sir John Pringle, without paying any regard to the difference of climate, I thought the violence of the fever required at least one bleeding: and finding the same evacuation recommended by Dr. Huek and Dr. Cleghorn, I was induced to open a vein during the first paroxysm in three of our patients at Culpee. The consequence was, the first did not bear the evacuation; his pulse flagged; and he was very delirious in the ensuing fit; the remissions became very obscure; and the exacerbations were only to be known by his delirium. The other two were seized very suddenly, and fell down in a deliquium; on opening a vein, they returned to their senses; but, before five or six ounces of blood were taken away, they became faint;

and the feverish paroxysm ran higher than in those who did not suffer the evacuation. For the future, I was determined to be very cautious in bloodletting ; and, therefore, laid it aside in every fever in warm climates, both at sea and on shore, unless accompanied with topical inflammation.

Since that period, even in the fevers which have occurred at Newcastle, I have not had occasion to prescribe bleeding, above three times, in genuine idiopathic fever ; and am certain I never lost a patient from omitting this evacuation.

ANTIMONIALS. Various preparations of this mineral I have tried, but prefer emetic tartar* to all others ; carefully avoiding every addition which might decompose its acid. It was at first dissolved in pure boiling water ; but finding a powder more convenient for common use, it was afterwards rubbed with eleven parts of sugar to make it more divisible. This preparation, though ever so carefully corked, after keeping, became moist, and crusted : the sugar was, therefore, changed for the same quantity of magnesia,† nor was the antimonial in the least robbed of any of its virtues by this addition. However, if, after exhibiting a few doses of this powder, its operation does not proceed to our wish, drinking acidulated liquors not only renders this, but every other antimonial preparation more active.

James's Powder, from what I have observed, is a more uncertain antimonial than emetic tartar in the fevers of hot climates, frequently lying inert in the stomach and bowels for some hours, and afterwards operating with great violence. Being convinced of its inferiority to

* Antimonium tartarisatum, Ph. Lond.

† See Formula Medicamentorum, No. 1, in the Appendix.

emetic tartar, I have not for many years made any trial of it. From a spirit of quackery, however, it is still sent out with directions to hot climates. When in proper hands I shall not presume to say, that it is an useless, or hurtful medicine ; but when given indiscriminately, and continued for any length of time, I am certain this popular remedy has too often proved fatal.

Antimonials are, by some, supposed to possess a powerful febrifuge virtue, as a remission of fever often ensues after their use. This seems to be effected in the following manner : during their operation, a kind of artificial paroxysm is raised ; which at last is carried off by a sweat, although the fever still may continue, and in a few hours be as much exasperated as ever. Their virtues, therefore, in carrying off fevers in their incipient state, seem to depend principally, if not altogether, upon their evacuating powers ; just in the same manner, as may be effected by any other emetic, and laxative. But, when once the fever is confirmed, antimonials are possessed of no virtues either to remove it, or to bring it to more regular remissions. And, when the disease has arrived to any degree of malignity, such debilitating medicines are extremely hurtful.

REFRIGERANTS. The saline draughts of Riverius are generally prescribed, with a view to dilute the bile, to cause a perspiration, and to bring the fever to more regular remissions ; but, as most fevers have this last disposition, what is merely the nature of the disease, has been imputed to the effects of the medicine. When given in an effervescent state, they will sometimes stay a vomiting, and remove an urgent symptom ; but, when exhibited alone, the highest character which can be given of them is, that they are very inoffensive, but possessed of no

virtues, either to cure a fever, or to bring it to more regular remissions. The other remedies, which have been tried with the same intention, are *spiritus mindereri* and nitre. Whole pints of the first have been given, without producing any sensible effect ; and as for nitre, if the fevers of warm climates demand the use of it, the stomach of the patient will not bear it in sufficient doses to answer any good purpose ; and, indeed, the prescribing of such remedies can only be accounted a specious pretext for doing something. When no other remedies are necessary, they are much surpassed by lemonade ; and barley, or rice-water acidulated ; the usual drinks and diluents of the patient.

ALEXIPHARMICKS. Amongst this class of medicines, I have tried camphor, snake root, musk, castor, salt of amber, salt of hartshorn, and the powder of contrayerva. The first was commonly prescribed, in the form of the *camphorated julep* of the London Dispensatory, with a view to cause a perspiration ; to relieve the head ; or to abate some urgent symptoms ; but very seldom with any remarkable success. In whatever way camphor is prescribed, it is a very nauseous medicine, and, in hot climates, will never sit, in sufficient doses, upon the patient's stomach. The snake root was most commonly given in the form of decoction, with a little opium ; it seemed to answer better than most medicines of this class ; and, was attended with considerable advantage, in the decline of fevers, when accompanied with a profuse diarrhœa : however, the same intention may be answered by much more agreeable medicines : for this reason, even at first, I never put much stress upon it, and, in my later practice, laid it entirely aside. I do not recollect a single instance of the good effects of any of the rest,

except musk and the salt of hartshorn. The first, if genuine, given to the quantity of a scruple every four hours, often abates hiccup, and other nervous symptoms ; and it likewise acts as a powerful cordial and diaphoretic. The latter was only prescribed in low cases as a stimulant ; and, therefore, was never long continued. In short, little dependence is to be put upon most medicines of this class. If they are prescribed with a view to relieve the head, they are much surpassed by blisters ; wine answers the purpose much better as a cordial ; and warm fomentations, or *pediluvia*, as antispasmodics, and diaphoretics.

OPIUM. This medicine, though possessed of no power to shorten the duration of fevers, often produces the most wonderful relief. For above twenty-three years I have given it freely, though with caution in fevers, and even in many cases of inflammation, without being biassed by any theoretical opinion concerning its mode of operation. If upon trial it was found to mitigate the suffering of patients under the agony of pain ; to raise the drooping spirits of the dejected ; and to procure quiet and refreshing sleep ; I have always persisted in its use, regardless whether its good effects depended upon its being a sedative or stimulant. The vain endeavours of physicians, indeed, to account for the mode of the operation of medicines, are not more conspicuous in any other article, than in opium ; and hypothetical reasoning on this subject has very much limited the use of this powerful medicine, intended by providence to sooth the miseries of the afflicted.

In the paroxysms of intermittent and remittent fevers, and in the nocturnal exacerbations of those which are continual, I have almost invariably found opium, to pro-

cure an alleviation, by taking off inquietude, inducing sleep, and by bringing on perspiration. In fevers of the low kind, attended with dejection and despondency, opium, by infusing pleasureable sensations, and by procuring sleep, if early given, very generally prevents delirium : and when spasmodic affections become troublesome, such as convulsive twitchings of the tendons, frequent hiccup, and constant inquietude, it is the only medicine to be relied upon : but its good effects here, in my opinion, depend upon its narcotic powers ; for unless it induces sleep, the relief is always transient, and often very trivial. At the same time, however, I must observe, that, in some constitutions, opium, even when most strongly indicated, often disagrees ; and, instead of procuring rest, occasions inquietude, starting, and next day intolerable head-ach.

But in no condition of fever is opium of more advantage, than in removing pain and irritability of stomach ; and in assisting this organ to bear the bark. In the Bengal fever, on account of the violent pain and vomiting, which ushered in the disease, I was frequently obliged to commence with opium ; and in the irritability of the stomach, which is often as severe in remittent, and some cases of continued fever in this country, I have found the same medicine equally necessary and efficacious ; especially when combined with the following article.

CALOMEL; This preparation of mercury is of very extensive use in mitigating some of the severe symptoms attending fever. In great irritability of the stomach, attended with vomiting of bile ; it is an indispensable addition to opium ; and when thus combined, at the same time that the convulsive motion of vomiting is allayed, bilious redundances are carried off by stool. But its good effects are not confined merely to its evacuating power,

for I am certain that calomel is well calculated to prevent determination to the abdominal viscera, which is so frequent a cause of death * in the remittent fever.

Impressed with the common opinion, that mercury dissolved the blood ; and finding it to have constantly an ill effect, when given for any urgent symptom, in such patients as had the *scorbutic diathesis*, I seldom exhibited it in the remittent fever of Bengal, in which I supposed there was a great tendency to putrefaction. But having, since that period, given calomel freely in the dysentery, as also in remittent fevers, attended with great irritability of the stomach, I am now convinced that mercury is possessed of no septic principle, and that it is one of the best medicines to open the bowels, and to prevent inflammation and corruption in the abdominal viscera. But, at the same time, I should never think of prescribing mercury, when actual symptoms of putrefaction have taken place in fevers ; such as hemorrhages, *petechiæ*, or purple spots ; for, in such a state of the fluids, mercury must be as hurtful, as it has been experienced in the real sea scurvy.

CURE OF THE REMITTENT FEVER.

HAVING made some observations on particular medicines, I shall now proceed to lay down the method of

* In the remittent fever of Minorca, Dr. Cleghorn found the intestines of those who died partly mortified and partly inflamed. Bartholine also found the stomach and duodenum mortified and inflamed in those who died of the epidemic fever of Copenhagen, in the year 1652. And no person can visit patients under remittent fevers, especially in hot climates, but must be convinced, from the burning heat, and the constant pain and vomiting, that some degree of inflammation in the stomach, duodenum, and liver often appears early in the disease, which if not speedily removed, too frequently proves fatal.

cure, which, in the course of my practice, I have found most effectual in the remittent fever.

Nothing is more indispensably necessary ; in the beginning of this fever, than to cleanse the intestinal tube by gentle vomits and purges. Nature seems always to indicate such evacuations by the plentiful secretion of bile, which, if not speedily discharged, often brings on an inflammation of the stomach ; nausea ; and hiccup ; preventing in the course of the disease, the effects of the most powerful medicines.

When the fever attacked slowly, or when I was called in the remissions, I found it the best course to give a vomit of ipecacuanha, with one or two grains of emetic tartar. If this did not move the bowels next day a dose of neutral purging salts was prescribed.

But, in dangerous fevers which rage epidemically, no time is to be lost ; therefore this method of evacuation is too tedious. In such cases, I have generally trusted to emetic tartar, given to the quantity of a quarter or half a grain every hour ; or oftener, till it acted by vomit and stool ; which last intention is rendered more certain by the addition of manna, decoction of tamarinds, a small portion of Glauber's cathartic salt* ; or a few grains of calomel. Any of these preparations ought to be given immediately after the invasion, as they not only mitigate the feverish paroxysm, but bring it to a quicker solution. But it is proper to observe, that evacuations of this kind are not to be long continued ; for it will be in vain to expect by these means to prevent a generation of bile ; for so long as the feverish indisposition continues, although an emetic and cathartic were repeated every day, more bile will still be secreted ; but as soon as the fever, which

* Natron Vitriolatum. Ph. Lond.

is the cause, is removed, the effect of consequence will cease.

Sometimes, instead of commencing with these evacuations, I found it necessary, to relieve the pain of the stomach, to give one grain of opium immediately on the attack of the fever; to apply fomentations to the region of the stomach; and to open the bowels by clysters. When the pain and vomiting were, by these means, removed, after an interval of two hours, I had recourse to emetic tartar, with the additions already mentioned. But, in some, the symptoms of inflammation in the stomach ran so high, that I was deterred from giving any thing more powerfully emetic than chamomile tea: and therefore was contented with mitigating the pain and vomiting with opium; and afterwards opening the bowels with the purging decoction, No. 5.

Since that period, I have had much experience of the superior efficacy of calomel, conjoined with opium, in taking off irritability of stomach; and in opening the bowels: and, therefore, in all dangerous remittent fevers, attended with vomiting, burning heat, and pain at the stomach, I would recommend the use of the pills, No. 4. Two ought to be taken immediately for a dose, and one to be repeated every half hour, till the pain abates. After this their operation should be assisted by clysters, fomentations, and, in very urgent cases, by the use of the warm bath. And when the irritability of the stomach is, by these means, removed, all bilious and corrupted humours should be carried off by the purgatives, No. 5, or 6, given by spoonfuls, and repeated frequently*.

* The yellow fever of the West Indies, and that of Senegal, (page 109) have been represented to be almost totally beyond the power of medicine. But I have little doubt, that the fatality of the worst kind

As soon as the intestinal canal has been thoroughly cleansed, the cure must intirely depend upon giving the Peruvian bark, in as large doses as the patient's stomach will bear, without paying any regard to the remissions or exacerbations of the fever. If the remissions be distinct, the bark, indeed, will have a more speedy effect in subduing the fever; but even if it become continual, by a regular and steady perseverance in the medicine, it will be effectually prevented from growing dangerous or malignant.

If, after evacuations, the stomach remain weak and squeamish, it is of the utmost importance to prescribe a full dose of opium. I seldom found it fail to remove irritability; and then the bark sat well on almost every stomach. On the contrary, if the disease was allowed to go on, or if time was wasted in watching for remissions, the disorder of the stomach increased, and other dangerous symptoms supervened, which often rendered the effects of the bark precarious.

When the stomach is weak, the bark ought to be given liberally in infusion or decoction; which are rendered much more effectual, by the addition of the South American Extract*. But as soon as the patient can digest the

of fever may be obviated by a practice similar to that above mentioned. In the yellow fever, as it has been called, I would recommend, after the bowels are unloaded by a purgative clyster, that at least one hundred drops of tincture of opium be given in three or four ounces of any emollient decoction, by way of clyster; and that the patient be immediately put into a warm bath: that, when he is removed to his bed, eight or ten grains of calomel be given in the form of pills, with opium, if the anodyne clyster have not totally removed the vomiting; and that the operation of these pills be hurried by the exhibition of more purgative clysters; and that, as soon as the bowels are opened, no time be lost in throwing in the bark in the most liberal manner.

* See Formulae. No. 7, 8, 9, 10, 11.

powder, immediate recourse should be had to it, in a saline draught ; port wine ; or when the patient has a great aversion to the powder, its taste may be easily covered, by making it into a draught, with a small proportion of brandy, and three or four table spoonfuls of almond or cow's milk sweetened with sugar. This draught should be taken, as soon as mixed, before the bark impart any of its bitter taste to the vehicle.

The most certain effects of the bark, if given early, are a gentle equable sweat, and often a loose stool. If it does not produce the last effect, especially if the symptoms indicate bilious redundances, laxatives, such as calomel, rhubarb, or clysters, may be occasionally exhibited. But if it run off by stool, it will be indispensably necessary to check this evacuation, by a few drops of tincture of opium, given in each dose.

If, during the course of the fever, local affections of the bowels take place, such as slight inflammation, or obstruction of the liver ; or a dysenteric state of the intestines ; besides blistering, much advantage will arise from the judicious combination of calomel with opium, as an auxiliary to the bark. And I, now, am persuaded, that owing to the fears I had of mercury being capable of inducing some putrefaction in the humours, I lost some patients of suppuration in the liver, the consequence of the Bengal fever and dysentery ; when a fatal determination might have, in all probability, been obviated by an early use of mercury. Where I, therefore, to treat such cases again, I should give two or more grains of calomel at bed time, occasionally with opium, and continue it, along with the bark, till such time as every symptom of danger disappeared.

Although the many frivolous arguments, which long

prevailed against the use of the bark, are now obviated by the united consent of the ablest Physicians, yet there still remains one fatal prejudice, which prevents its more general exhibition. When a fever has distinct remissions, few Physicians will scruple to prescribe it ; but, if the disease assume a continued form, every method is tried to bring on regular remissions ; if this cannot be accomplished, and the patient's strength begins to sink, alexipharmicks, blisters, and cordials are employed to support him. The use of the bark, at that time, would be thought highly dangerous, and has therefore been cautiously prohibited by almost every medical writer since the days of Sydenham. But experience affords sufficient proof, that this objection has no manner of foundation, and that the bark may not only be given with the greatest safety, both in the remissions and exacerbations, but even when the disease is continual.

The diet of the sick ought to be of the most antiseptic kind. Ripe fruit answers very well both the intention of food and medicine. The panado, sago, and other diet on board of ship should be acidulated ; or the drink may be rendered agreeably tart by crystals of tartar or elixir of vitriol. If the patient's strength begins to sink, he should be freely supported with wine in his drink, food, and medicines : his linen should be frequently changed, and his apartment kept as cool and clean as possible. When he longs for cold water, which is frequently the case, it may be allowed him freely, as it will be found the best diluent. Nothing, indeed, in acute diseases, can be more cruel than to refuse a patient the gratification of his strong cravings. Very happy effects often follow from indulging them ; and if what is longed for be very improper, there will never be so much of it taken as to do any harm. On board of ship, porter, punch, cheesc, and ham, are most

frequently desired by the sick in fevers ; and however improper they may appear, I have often seen an allowance of them produce the best effects.

CASES OF THE REMITTENT FEVER.

HAVING given a description of the remittent fever, made some observations on particular remedies, and laid down the principal indications of cure, I shall, now, illustrate the whole by the following cases, which are selected from a number faithfully minuted on the spot, and are related nearly in the order they came under observation.

In the treatment it will appear, that little regard has been paid to private opinions or public systems ; uninfluenced by any theory, however plausible and ingenious, it was my constant aim carefully to observe the symptoms of disease, and the effects which medicine produced.

Before I proceed to the narration of particular cases, it is also proper to premise, that the bark which was used, being selected in England, was then of a superior quality to what can be at present procured. Owing to this drug either being of an inferior quality, or more probably to the wicked practice of adulteration both in America, and in this country ; for some years past I have found it necessary, even in agues, to double the quantity : And therefore must recommend the necessity of giving the bark in powder, in the dangerous fevers of hot climates, at least from one to two drams for a single dose.

CASE I.

May 8th, 1768, lat. 13 deg. 29 min. S.

STEPHEN LEVEN, one of the company's recruits, complained of a head-ach, pain and sickness at stomach.

His countenance was flushed, his skin very hot, and his pulse quick and soft. Five grains of the antimonial powder, No. 1, were given every hour, with plentiful dilution, which discharged much bile, and sweated him profusely; he was, however, very restless during the night.

9th. In the morning, his tongue was dry and parched, his skin hot, and his head-ach more violent. As he was costive, he had a dose of salts, which purged him thrice. At night his fever still continued. One quarter of the antimonial powder was prescribed.

10th. In the morning his tongue was more foul, he was troubled with great inquietude, and his pulse beat 103 in a minute. The powder was continued every three or four hours, with two spoonfuls of the Mindereri julep; his medicines sweated him, and at night he appeared to be easier, but soon became delirious.

In the morning of the 11th, his pulse beat 100, his tongue was covered with a brown dry crust, his countenance livid, and his skin very hot. His medicines were repeated every six hours, and a little white wine was allowed in his drink. At night his skin was still very dry and hot, his pulse was more accelerated, he had a slight stupor, and was again disposed to rave. The pediluvium was used, a blister was applied betwixt his shoulders, spirit of nitre was added to his drink, and two spoonfuls of the camphorated julep prescribed every four hours.

12. He raved very much during the night, and his julep occasioned a slight nausea. In the morning his skin was hot, but clammy; his pulse small, quick, and feeble; and he was troubled with slight twitchings of the tendons. Two ounces of the bark decoction No. 10

were prescribed every hour, and he was allowed red port in his drink ; his medicines sat easy on his stomach, but he had a very restless night.

In the morning of the 13th, he was very sensible, had a gentle moisture on his skin, but his pulse was very weak and feeble. Two scruples of bark, in red wine, were given every two hours, and toast and water, with a little port, was ordered for his drink. He took his medicine five times : in the evening his pulse was more firm : and he had some rest in the night.

14th. In the morning his pulse beat 90 ; he was in equable diffused sweat ; but his tongue was still rough and dry. At night, petechiæ appeared on his arms.

On the 15th and 16th, little or no alteration could be observed.

On the 17th, he was free from feverish symptoms ; the petechiæ were gone ; but he was very feeble and giddy. The bark and wine were continued for some time longer ; however, it was several weeks before he recovered his usual strength.

Another of the recruits was seized with the fever, about the same time, as the former patient. On the third day, the bark was prescribed, although no distinct remissions could be perceived, and he was soon restored to health.

CASE II.

May 28, 1768, lat. 34 deg. 47 min. S.

THOMAS SPARKS, aged about twenty-six, of a strong healthy constitution, and who had never before been in a warm climate, was seized with head-ach, alternate flushes

of heat and cold, and pains in his back and limbs. These symptoms were succeeded by drought, restlessness, and oppression : but his pulse was very little accelerated. An emetic, with ten grains of ipecacuanha, and two grains of emetic tartar, was given, which operated very well, and relieved him greatly. In the afternoon he went to bed, and was sweated with warm sage-tea, and spirit of hartshorn.

29th. On the morning he found himself able to walk about ; but he was still feeble and oppressed, and complained much of head-ach. The bark was prescribed ; however, he went about drooping some days longer, and neglected his medicine.

June 1. In the afternoon he was seized with slight rigors, which were succeeded by heat and drought, and he had a very restless night.

2d. In the morning, when he sent for me, he complained of a very severe head-ach, his skin was exceedingly hot, his tongue parched, and his pulse very small and quick. Half the powder No. 1, was prescribed every four hours, which operated well, and relieved him considerably. In the night the powders purged him frequently, and he imprudently went out into the open air.

3d. In the morning the feverish heat was greatly increased, and his head-ach was almost insupportable : but his pulse, though quick, was very small. Powders, with camphor and nitre, were prescribed, which only forced a partial swea; and in the night he became delirious.

4th. In the morning his skin was intensely hot, his eyes looked dull and heavy, his pulse was very quick and feeble, and he had a considerable degree of stupor. His feet were bathed in warm water, blisters were applied to the ancles, wine was allowed in his drink, and two spoon-

fuls of the camphorated julep were prescribed every two hours. At night he was pretty sensible.

5th. No alteration. His medicines were continued, and the pediluvium used.

6th. The stupor and insensibility rather increased, and his pulse flagged much. At night his countenance was wild and staring, and he was troubled with twitchings of the tendons. A large blister was applied betwixt his shoulders, the camphorated julep was continued every four hours; and a bolus with theriac, castor, and salt of amber, was given at bed-time.

7th. He was delirious in the night. Towards the morning he had a partial sweat. His tongue was very black and crusty, the twitchings of the tendons more frequent: he dozed much, and was insensible.—Two ounces of the decoction of snake root with some tincture of opium, were prescribed every three hours; and wine was given freely.

8th and 9th, he continued his medicines; however, they produced no alteration.

On the 10th, the stupor and insensibility increased much, with picking at the bed clothes. One of James's powders was given, and repeated a second and third time, which only forced a clammy moisture on his neck and temples. At night, his pulse was very weak, and so quick that it could not be numbered. Sinapisms were applied to his feet, and a spoonful of cordial julep was prescribed frequently, as he could still swallow.

11th. He lay comatose and senseless, and was covered with cold clammy sweats. The sinapisms were repeated, but had no effect in rousing him.

12th. The twitchings of the tendons and picking at the bed-clothes were more frequent, and he could swallow

nothing but a little wine and water. These symptoms increasing, his extremities became cold ; his pulse failed ; and he was carried off by convulsions in the afternoon of the 14th ; without a single symptom of putrescency, or any evident marks of a dissolved state of the blood.

CASE III.

July 18th, 1768, lat. 14 deg. 10 min. N

WORTHINGTON PRICE, serjeant, never before subject to any disease, except an obstinate ague, which he contracted by a short residence in a fenny county of England, was seized at night with a feverish paroxysm, which terminated in the morning by a profuse sweat.

19th. When first I visited him, he complained of weariness, head-ach, and low spirits ; his tongue was white and foul, and his pulse small and feeble. An antimonial puke was exhibited, which operated well ; but in the morning the feverish paroxysm returned. Two drams of antimonial wine, mixed in a pint of warm sage-tea, were prescribed at separate draughts, which soon produced a plentiful sweat.

On the morning of the 20th, he was free from fever ; but complained of great prostration of strength, and was very much dejected. His ague being formerly removed by the Peruvian bark, and succeeded by obstinate rheumatic pains ; from prejudice, he refused taking any of this medicine ; but said he was willing to follow any other directions which might be judged proper. The bark was, however, prescribed in a form to cover its taste, which sat very easy upon his stomach ; but in the night he had an accession of fever.

21st. His head-ach became more severe, and he com-

plained of giddiness when he attempted to walk ; being unfortunately told, unless he took the *bark* more regularly, and in larger doses, he could not expect to get soon better ; he was angry at being deceived, and absolutely refused taking any more medicine.

On the 24th, he was obliged to confine himself to his hammock. When I visited him, he was very hot and feverish ; his tongue was dry and furred, and he was troubled with head-ach, anxiety, and oppression. One half of the powder No. 1 was repeated every four hours, which operated well. At night he was in a profuse sweat, and his pulse was more full and soft.

On the morning of the 25th, he had a pretty distinct remission. Two scruples of bark were prescribed in a saline draught ; but, when he discovered the medicine, he refused it. In the afternoon, the feverish paroxysm returned ; his feet were bathed in warm water ; and the saline julep was prescribed. He was delirious in the night.

26th. In the morning, he was sensible, but his skin continued hot and dry. Two ounces of the decoction of snake root with tincture of opium were prescribed every three hours. In the night he rested well, and sweated freely.

On the 27th, he continued calm and easy through the day, took his decoction regularly, but could not be persuaded to have recourse to the bark. In the night, his fever returned ; he was very delirious, got out of his hammock, and ran upon deck.

28th. His pulse was very quick ; his skin intensely hot ; and the delirium remained. His feet were bathed ; his head shaved ; a blister applied betwixt his shoulders ; and two spoonfuls of the camphorated julep, with spirit of *Mindereri*, were prescribed every two hours.

29th. No alteration. He continued his medicines.

30th. He was both comatose and delirious. His medicines only occasioned a partial sweat; blisters were applied to his ancles; and wine was prescribed freely.

31st. Very little alteration.

August 1. The coma and delirium continued; his lips and teeth were covered with a glutinous crust; and his breath was very offensive. A strong decoction of bark was prescribed, but was swallowed with difficulty. Sinapisms were applied; and he was supported with wine.

2d. No alteration.

3d. Large livid spots appeared on each foot; his pulse was exceedingly quick and feeble; his countenance horribly ghastly; and his stools very offensive. The bark was tried in clysters, but was not retained.

The following days he lay stupid and insensible, continually muttering to himself, and picking at the bed-clothes. All medicines were laid aside, yet he protracted a miserable existence to the 8th, when his body, soon after death, emitted a very cadaverous smell.

CASE VI.

July 23d, 1768, lat. 4 deg. 49 min. S.

JOHN VICKARIE, one of the company's recruits, aged eighteen, in the evening, was seized with rigors, head-ach, and pains in his back and loins; he soon became hot and thirsty, and passed a restless night.

24th. In the morning, when I first visited him, his pulse was 100, his countenance much flushed, his skin very hot, and his thirst insatiable; he complained of sickness at stomach, and vomited much bile. A grain of tartar emetic was given at separate draughts, which operated easily. At night, his fever returned with violence;

all the former symptoms were aggravated, particularly the pain at the stomach and bilious vomiting. A grain of solid opium was given, and a saline draught was prescribed every two hours in the act of fermentation. He was troubled with the greatest inquietude in the night, and his stomach rejected every thing he drank.

25th. In the morning his fever continued, and the nausea and pain of his stomach were very severe; fomentations were applied, and the draughts repeated, which procured him some ease. At night, the feverish paroxysm ran very high, the pain of his stomach was almost insupportable, with incessant vomiting of bile. The pediluvium was used, a cataplasm with theriac, camphor, and three drams of tincture of opium, was applied to the stomach. Soon after this the pain abated, and he slept for an hour. When he awaked, he called for cold water, which was allowed him in small draughts. In the night he was restless; drank plentifully; and fell into a sweat towards the morning.

On the 26th, he had no distinct remission, his skin continued hot, his countenance was gloomy, and his eyes were of a yellow colour. Two ounces of the bark decoction were prescribed every two hours, which sat easy on his stomach. In the evening he had a loose stool, and the feverish heat increased. His feet were bathed in warm water, wine was added to his lemonade, and his medicine was continued. In the night he was delirious, but became calm towards the morning.

On the 27th, when I visited him, a gentle moisture was diffused over his skin, but his pulse was small and fluttering. His countenance was exceedingly ghastly, and he was not perfectly sensible. Two scruples of the bark were prescribed every hour. In the afternoon his pulse

was better. As the bark had a tendency to run off by stool, tincture of opium was added.

On the 28th and 29th, his fever abated, and in three days more totally left him.

After this, he was seized with an excruciating pain in his right hip, which was removed by the application of a blister. He continued the use of the bark for some days longer, and soon recovered his usual health and colour.

CASE V.

July 22d, 1768, lat. 6 deg. 33 min. S.

MR. G——, a cadet, aged about eighteen, for two or three days, had been indisposed with a head-ach, want of appetite, and low spirits. On the morning of the 22d, he was seized with alternate flushes of heat and cold, and pains in his back and limbs. These complaints were succeeded by head-ach, hot skin, and profuse bleeding from the nose. A dose of crystals of tartar and manna was prescribed, which procured him two stools.

On the morning of the 23d, his skin was still hot, his countenance pale, and his tongue foul and white; he had no considerable drought; and his pulse was small, but scarcely quick. Two ounces of the decoction of bark, with ten drops of the diluted vitriolic acid, were prescribed every two hours.

On the 24th, he complained much of head-ach, giddiness, and oppression; his tongue was very dry, his skin hot, and his pulse 100. His medicine was continued, and lemonade with wine was prescribed for his ordinary drink. At night, the inquietude was greater; his feet were bathed in warm water.

25th. In the forenoon, he was again attacked with the hemorrhage from the nose, which was soon stopped.

The blood was very thin, and scarcely tinged the cloth: His pulse became more quick and feeble, and he was very dejected. As he had an aversion to the bark in substance the draughts were continued as before.

26th. The same, only his tongue was more foul, and his teeth crusted.

27th. No alteration.

28th. Towards night, he was comatose and dosed much, and had another attack of the hemorrhage. A bolus, with theriac, salt of amber and camphor, was prescribed. He sweated some in the night, but had little or no rest.

On the 29th, the heat of his skin continued ; his pulse was small and quick, and his breath very offensive. The bark decoction was again prescribed ; and as he was costive, a clyster was injected in the evening. However, in the night, he was delirious.

On the 30th, he was comatose. He took the bark decoction and wine freely. At night, no alteration ; a blister was applied betwixt his shoulders.

31st. He still continued comatose ; his pulse was a little better, and the bark decoction was repeated, with a few grains of the powder in each dose.

August 1st, he was very sensible ; his pulse began to rise ; his blister was dressed, but digested ill.

On the 2d, he was pretty easy. As the bark purged him, a few drops of tincture of opium were added to each dose.

On the 3d, he continued to recover ; he had no appetite, but a great craving for wine ; it was allowed him freely, and he persisted in the use of his medicines. After this, his appetite began to return, and he recovered gradually.

On the 10th, he fell into a purging, which was removed by a few doses of rhubarb and diascordium. As he was still weak, the tincture of bark was prescribed twice a day.

On the 27th, he was able to go to Calcutta.

CASE VI.

Culpee, September 6, 1768.

HENRY POPE, seaman, a young man of a very strong and healthy constitution, was sent, on the 30th of August, 1768, along with some others, to assist the *Ankerwyke*, that passed us in great distress, in her way to Calcutta. The people were employed at hard work, constantly relieving one another at the pumps.

On the 3d of September, he was seized with sickness at stomach, violent head-ach, and bilious vomiting, which obliged him to retire from his duty. When he asked for medical advice, he was ordered to return to his labour, with a hint that his disease was only the effect of drunkenness. Next morning he found himself a little easier; but the head-ach still continued, and he was very weak and feeble. Being affronted at the judgment passed upon him, he made no farther complaints, and was sent with his ship-mates in a boat to return to Culpee. In the afternoon, he was again seized with fever; great agony at stomach; incessant vomiting; head-ach; and drought.

September 6th. On the evening, when I first saw him, he complained of the most acute pain at the stomach, which was swelled, very painful, and felt hard to the touch. His head ached violently; his tongue was furred; his countenance yellow and ghastly; and his skin was cold and clammy. He was ordered some warm wine and water, which he immediately rejected with a strong

hiccup. A grain of opium and fomentations were prescribed. After this, his skin became warm, but his pulse was small and fluttering. In an hour, the vomiting returned as violently as ever, and he had two purging bilious stools. He drank some warm chamomile tea to cleanse his stomach; a saline draught, with tincture of opium, was prescribed at bed-time; and the saline draughts ordered to be given frequently in an effervescent state during the night: he, however, vomited and purged often.

On the morning of the 7th, his skin, but particularly his temples, felt very hot; his countenance was wild and staring, and his tongue very brown and parched. Two ounces of an opening mixture, with emetic tartar, manna, and decoction of tamarinds, were prescribed every hour. In the afternoon, he had three easy stools; but the pain in the stomach, and over the whole epigastric region, continued as violent as ever. His skin was cooler, and his pulse better. A grain of opium was given; an anodyne cataplasm applied to his stomach, and a strong decoction of bark was left with his attendant, to be taken as often as his stomach would bear.

In the morning of the 8th, he was insensible at times, and complained of great pain all over the epigastric region. His pulse was very small, quick, and fluttering; his skin hot and clammy; and he frequently applied his hand to his temples. An emollient clyster was injected; his head shaved; the fomentations repeated; and the saline draughts were prescribed, as the bark would by no means sit upon his stomach. Through the day he had several bilious stools; his pulse was irregular, and his skin clammy. He was frequently very sensible, and made rational answers; but, in a moment, he would stare wildly, and become very delirious. His feet were im-

mersed in warm water and vinegar. At night, he was very sensible ; his bowels were still swelled ; and he complained of great pain in the reigon of the liver. The saline draughts and fomentations were continued, and a blister applied to the part affected. In the night he raved much, and purged very frequently.

9th. In the morning, he had short intervals of sensibility ; and complained of the most excruciating pain in his stomach, and in the region of the liver. The fomentations were continued, and he took, at separate draughts, six ounces of a decoction of tamarinds, and three drams of Epsom salt*. Through the day he was, for the most part, insensible, and covered with cold clammy sweats. In the afternoon, when I visited him, his breath was very fetid, and he had two offensive stools. The bark decoction was again prescribed, which now sat upon his stomach. At night, when I visited him, he seemed very calm, quiet, and sensible ; but, in an instant, began to talk very incoherently ; and his face became convulsed. These fits returned frequently and were succeeded by a delirium, which continued through the night. The bark decoction was continued with tincture of opium.

10th. On the morning, he was again very sensible ; but his skin was clammy and moist, his pulse weak and fluttering, and he was troubled with frequent convulsive twitchings of the tendons, tremors, and strong hiccup. The bark decoction, with tincture of opium, was still continued ; and he was supported with wine : but every thing he took was soon carried off by stool. The mortal symptoms encreasing, nothing farther could be expected from medicines, which were therefore laid aside. At seven o'clock, his pulse failed, he lay speechless, and was carried off by convulsions at night.

* Magnesia Vitriolata Ph. Lond

CASE VII.

Culpee, September 8th, 1766.

THOMAS BULLMAN, carpenter's mate, aged twenty, was seized in the morning with rigors, head-ach, and sickness at stomach. These symptoms were soon succeeded by heat, thirst, and restlessness; but his pulse was feeble, and little quicker than natural. An antimonial puke was prescribed, which discharged much bile. At night, the feverish accession returning, half the powder, No. 1, was given at bedtime; he rested ill in the night, but towards morning fell into a profuse sweat.

9th. When I visited him, he was pretty free from fever, but his head-ach still continued, and he was weak, feeble, and giddy. At noon, he was seized with slight rigors; and, as the paroxysm advanced, he turned excessively hot, puked gall, and was disposed to rave. The decoction, No. 2, was given, which operated upwards and downwards. At four, a dram of bark was prescribed every two hours, which sat well upon his stomach. Through the rest of the day his pulse was almost natural, but the head-ach and pain of his back were very uneasy. He had little or no rest in the night.

10th. In the morning, he was free from fever. As he had only taken two doses of bark in the night, two drams were exhibited at eight; and a dram was continued in port wine every two hours. He took an ounce by night, and had no exacerbation of the fever.

On the 11th and 12th, he was free from fever, but weak, feeble, and giddy. The bark was still continued. From this time, I did not visit him: he gave over his medicines, and soon suffered a relapse.

20th. In the morning, I found him confined to his bed ; he was much exhausted, and complained of great head-ach and a troublesome cough ; his countenance was very ghastly, and he had not the least appetite. A vomit was prescribed, which discharged a considerable quantity of viscid bile. At night, his skin became hot and clammy, his cough was very uneasy, and he puked some ropy phlegm. A dose of the camphorated tincture of opium was prescribed at bed-time ; however, he passed a very restless night.

21st. In the morning, his skin was cool ; he complained of a head-ach, and the cough still continued. Wine was prescribed freely, and he took a dram of bark every two hours. At night, the cough remitted, and the feverish paroxysm returned. The anodyne draught was repeated. He sweated much in the night, the cough was again troublesome, and he got little rest.

On the 22d, he was pretty easy, but very feeble. The bark was continued ; and his drink was acidulated with diluted spirit of vitriol*.

23d. In the afternoon, he was very hot and restless : his cough increased, and he became sick at stomach. The vomit was repeated.

After this, he began to recover daily ; the hectic heat and cough disappeared. The bark, however, was continued for some time longer ; and rhubarb was occasionally given, as he became costive.

On the 29th, his complexion and appetite began to return ; but it was the end of October before he was fit for duty.

* Acidum vitriolicum dilutum Ph. Lond.

CASE VIII.

Culpee, Sept. 10th, 1768

JOSHUA ARCHER, gunner's mate, in the morning was suddenly seized with violent head-ach, sickness at stomach, and pains above his eye-brows. His countenance soon became flushed, his pulse full and strong. The heat of his skin was very considerable, and he continually vomited bile. He was bled; but, when six ounces were taken away, his pulse began to flag. The emetic powder, as in the above case, was prescribed. The pain of his stomach was relived; but he grew more restless: his head-ach became almost insupportable, and his skin very hot. At night, his pulse beat 115. The pediluvium was used, and an antimonial draught was prescribed.

On the morning of the 11th, he had a very severe accession of fever, with pain and sickness at stomach. He took four doses of bark.

12th. The feverish paroxysm returned at three in the morning. When I visited him, he was in a gentle moisture; his tongue was foul; his pulse small, quick, and feeble; and he complained of great head-ach and giddiness. The bark sat easy on his stomach; but by night he had only taken five drams.

On the morning of the 13th, he had a slight paroxysm, but could not be prevailed upon to take his medicine regularly. His fever returned in the night.

On the 14th, he took six drams of the bark.

On the 15th, he was free from every complaint, except weakness.

On the afternoon of the 21st, he was seized with a feverish paroxysm, much more severe than ever.

In the morning of the 22d, when I visited him, he was in a profuse sweat, but complained of head-ach; and said he had suffered so much in the night, that he would now willingly take any medicine. The bark was again prescribed every three hours.

On the 23d, he complained of a cough, and had a slight pain in his right side. The bark was continued, with a few grains of rhubarb; and he seemed to recover fast.

On the 28th, he was feverish, much dejected, and the pain under the right hypochondrium was troublesome. A blister was applied to the part affected; the bark was continued three times a day, with a cupful of an effusion of chamomile flowers with salt of tartar.*

On the 31st, he was cool; the cough, and pain in his side were removed; and he was able to go about. He continued his medicine for three days more, and, though weak, returned to duty.

CASE IX.

Culpee, Sept. 13th, 1768.

JAMES HUTTON, seaman, aged twenty-five, of a strong constitution, in the morning, was seized with giddiness, head-ach, violent pain at the pit of the stomach, and fell down in a fainting fit. As he continued insensible for some time, a vein was opened: when four ounces of blood were drawn, he came to himself, and complained of great weakness and violent head-ach. He had a reaching to vomit; his pulse soon became more full, and his countenance flushed. The decoction, No. 3, was prescribed. About eleven, the paroxysm was greatly increased; the heat of his body became intense; he was

* Kali præparatum Ph. Lond.

very restless, had slight twitchings of the tendons, and seemed disposed to rave. His medicine discharged much bile by vomit and stool, and sweated him profusely. At night, he was easier; but still complained of great feebleness and head-ach.

On the morning of the 15th, he had a feverish paroxysm, with great inquietude and thirst: his pulse beat 100, and his tongue was foul and dry. The purging decoction, No. 5, was prescribed, which operated several times. In the afternoon, a profuse sweat relieved him considerably. A draught with two ounces of the bark decoction, and a scruple of the powder, was prescribed every hour, which sat easy upon his stomach.

15th. He passed a very restless night; however he continued his medicine, and, towards the morning, had a purging bilious stool. When I visited him, his skin was cool, but clammy; his pulse small, but very little quicker than natural: his breath was offensive, and his countenance sallow and dejected. A dram of bark was prescribed every hour and a half, in a glass of port wine. At night his pulse was better; he was in a warm sweat, and had taken seven doses of his medicine.

16th. In the morning, though weak and feeble, he was perfectly free from fever. The bark, with wine, was repeated every two hours. He continued its use, thrice a day, for some time longer: his appetite began to return; and, in a fortnight, he was fit for duty.

CASE X.

Culpee, September 16, 1768.

———, of a weak and delicate constitution, long subject to a train of nervous symptoms, for which,

in his own country, under the direction of an eminent physician, he had tried every remedy in vain. As the only remaining resource, he was advised a long sea voyage and a warm climate, which soon relieved his former complaint. Being in the way of infection, on the 16th of September, he was seized with the common symptoms of fever; he went to bed, and drank some warm tea, and vomited abundantly. In an hour, the feverish paroxysm increased exceedingly. A grain of emetic tartar dissolved in rice gruel was taken at separate doses, which sweated him very profusely; but, as no remission followed, one half of the powder, No. 1, was prescribed at bed time; he continued restless through the night, his head-ach increased, and he was disposed to rave.

On the morning of the 17th, his skin was cool, his pulse pretty natural, but he still complained of great oppression, head-ach, and faintness. One dram of the bark with one scruple of soluble tartar * was given every hour. In the afternoon, he had two stools, which occasioned a great dejection of spirits: his medicine was therefore changed, and a dram of bark, in a glass of port wine, prescribed every two hours; however, in the night, he had another accession of fever, and continued restless; but, towards morning, he fell into a profuse sweat.

On the morning of the 18th, he was free from fever, but very weak, feeble, and giddy. His arms and breast were full of miliary eruptions. Being confined to a small apartment from the first attack, he was removed to the great cabin, where, enjoying a more free air, he found himself instantly relieved. Fearing another attack of his fever, he took two drams of the bark in the morning, and a dram regularly every hour, till one ounce and a half were

* Kali tartarizatum Ph. Lond.

used. This large quantity sat easy upon his stomach, and procured one copious stool.

On the morning of the 19th, he was pretty free from every feverish symptom; but was still very feeble and faint. About mid-day, he was seized with dimness of sight; and saw objects double: his mouth and jaws were affected; and he faltered in his speech. These, having formerly been symptoms to which he was subject, did not much alarm him. The bark and wine were continued every three hours; and, at night, he found himself perfectly easy, though weak. From this time, the fever left him: but he fell into profuse sweats; his appetite did not return; and he was troubled with acidity and low spirits. For these complaints, he took magnesia; asa foetida; bark and bitters. He used the cold bath; and in a month was restored to his usual health.

CASE XI.

Culpee, Sept. 24th, 1768.

WILLIAM JOHNSTON, seaman, a young man of a delicate constitution, who had never before been in a warm climate, in the morning was seized with head-ach, sickness at stomach, and vomiting of bile, which he encouraged by drinking warm tea. At ten, when he sent for me, he was in great agony from the pain in his stomach; and was possessed with the greatest fear of dying immediately: his countenance was flushed, his skin exceedingly hot, and every thing he drank was rejected. Fomentations were applied to the region of the stomach, and a grain and half of solid opium prescribed. In an hour and half, the pain of the stomach remitted, but the feverish paroxysm increased. The

decoction, No. 2, with only one grain of tartar emetic, was ordered in separate draughts, which discharged abundance of bile upwards and downwards, and sweated him profusely. At night, his skin was cool, and his pulse pretty regular; but, when out of bed, he was feeble and giddy. Two ounces of the bark decoction were ordered every hour.

25th. In the beginning of the night, he had some rest: in the morning, the feverish paroxysm returned, and he vomited frequently. When I saw him, he was in a clammy sweat, the nausea, anxiety, and restlessness still continued, with a fullness at his stomach, and aching above his eye-brows. He took the prescription, No. 5, and, without waiting for the full effects of the medicine, a dram of bark was given every two hours, in port wine. At night, he had three stools; he was weak, feeble, and faint. The bark was prescribed every hour; occasionally with a few drops of tincture of opium.

26th. As he was afraid of another attack, he took his medicine six times in the night. In the morning, his skin was cool, and he was free from head-ach, but complained of great feebleness and giddiness, when in an erect posture. The bark was continued every four hours, with wine: the return of the fever was prevented, and he recovered daily.

In the beginning of October, he was seized with the dysentery, which was very frequent on board. As I did not attend him, I do not know how he was treated.

On the 12th, being sent to the hospital, he died in his passage to Calcutta.

CASE XII.

Calcutta, October 12th, 1768.

Mr. M———, aged twenty-two, after attending a sale of clothes, belonging to some deceased gentlemen, and walking home in the heat of the sun, was seized with slight chilly fits, head-ach, and sickness at stomach. His skin soon became hot, his countenance flushed, and the pain of his head increased, with difficulty of breathing, and heavy sighs. Half the powder, No. 1, was given every hour, which operated well. In the night, all his complaints increased; the paroxysm ran high; and he became delirious.

On the morning of the 19th, he was sensible, but still complained of head-ach, pains in his back, thirst, oppression, and inquietude: his tongue was foul, and his pulse 100, small, and quick. As he refused the bark in substance, two ounces of the decoction were prescribed every hour; but having an aversion to the medicine he did not take it. In the afternoon, his skin was very hot; his pulse 115; and the paroxysm became violent. Five grains of the powder, No. 1, were given in a saline draught, and the pediluvium used. At night, he was delirious. The powder was repeated; and the bark left with his attendants, to be given as often as he could be prevailed upon to take it.

On the morning of the 20th, his skin was pretty cool, his pulse still quick, and his tongue foul and parched: he had a gloomy look, and seemed to be affected with stupor. As he could not be prevailed upon to take the bark, it was changed for the saline draughts. At night, he became very restless; had a wild countenance, and appeared disordered in his senses: his feet were bathed;

a large blister applied betwixt his shoulders ; and a draught, with a quarter of a grain of emetic tartar, was prescribed every four hours. In the night, he was very delirious and unmanageable.

On the morning of the 21st, his pulse was small, quick, and fluttering ; his skin clammy ; his teeth covered with a black crust ; and he was comatose and delirious at times ; his breath and all the excretions were very fetid. He was taken out of bed and had his linen changed, and his feet immersed in warm water. The blister discharged well, and was dressed ; the bark was again tried, and he swallowed one dose with great difficulty. Through the day, his pulse frequently varied ; and he continued comatose, insensible, and stupid. At night, he had frequent twitchings of the tendons. As he now refused every medicine, sinapisms were applied to his soles.

On the 22nd, he continued in the same state of insensibility ; his tongue was black ; his breath exceedingly offensive ; and the blistered part had a gangrenous appearance. At night, his extremities became cold ; his skin was clammy ; his stools ran off involuntarily ; and, about four next morning, he died in convulsions. His body, soon after death, was covered with livid spots ; and the room in which he lay was very offensive, although it was frequently sprinkled with camphorated vinegar.

Mr. L—— having accompanied the former gentleman, whose case is related, was seized at the same time with fever. After cleansing the first passages, he took the bark in large doses, and soon recovered.

CASE XIII.

April 9th, 1771, lat. 4 deg. 33 min. N.

HENRY CASTLES, gunner's mate, aged thirty-six, brought up to the sea, and never before subject to sickness, last night, at twelve o'clock, was seized with rigors, pains in his back, heat, thirst, and frequent vomiting. These complaints continued, in the morning he took half a grain of emetic tartar. When I saw him, his countenance was flushed, his skin hot, and his pulse 96; his stomach was tense, swelled, and painful to the touch; he was in the utmost agony, and continually vomited bile. A grain of opium was given immediately; fomentations were used; and, two hours after, the purging decoction, No. 5, was prescribed. The nausea abated, and he retained the physic, which procured him four bilious stools. At night, he was in a profuse sweat; his pulse beat 80; and the pain of his stomach abated. The bark was prescribed, but his stomach did not retain it.

10th. At two in the morning, he had a violent accession of fever, with unsufferable head-ach, nausea, and vomiting. At eight, when I saw him, his pulse was very small, quick, and obscure: he complained much of head-ach and giddiness; his countenance was gloomy, and his eyes red and watery; and the pain, tension, and sickness at stomach remained. Half an ounce of Epsom salt was prescribed at two separate draughts; and two hours after, he began the bark decoction, with the tincture. At night, he had taken six doses of the decoction, and had two purging stools; his stomach was easy, less swelled, and his pulse was more firm. Fifteen drops of the tincture of opium were given in the bark decoction at night.

11th. The feverish paroxysm returned at twelve last night. On the morning, when I visited him, his skin was clammy ; he complained of great anxiety, thirst, head-ach, and disorder at his stomach, which was painful and much swelled. Large stupes of flannel were wrung out of a warm fomentation, and applied to the abdomen ; the salts were repeated as yesterday ; and two drams of powdered bark were added to eight ounces of the decoction, which was given, every hour, after the first stool, in as large doses as his stomach would bear. At night, he was easy, and the whole of his medicine sat well upon his stomach. It was continued through the night, with a few drops of the tincture of opium to prevent it from running off by stool.

12th. He had a slight paroxysm last night, and awaked calm in the morning, but was very weak, feeble and giddy. A dram of bark was prescribed every two hours in red port ; at night, he had taken an ounce ; was much easier, and in better spirits. After this, he recovered daily. He was allowed a nourishing diet from the captain's table ; continued the bark and wine thrice a day ; and, on the 26th, though weak, returned to duty.

On the 1st of May, he relapsed : the feverish paroxysm was very severe, attended with great pain and heat at the pit of his stomach, and vomiting of bile ; and his eyes and countenance became yellow, as in a jaundice. After cleansing the first passages by the prescription, No. 5, a grain and a half of solid opium were given, and the bark prescribed every hour in dram doses. By these means, the next paroxysm was mitigated ; and his fever totally left him on the 3d. He continued his medicine three times a day to the 6th. Having omitted the bark, on the 8th he was again seized with a feverish paroxysm, conti-

ning for twenty-four hours, and which was not removed till he took an ounce of the same medicine. After this, his stomach was very weak; his countenance continued sallow; but, by the use of bark, bitters, and rhubarb, he was restored to health; and, on the 19th, returned to duty.

CASE XIV.

June 2d, 1771, lat. 34 deg. S.

ROBERT LAVENDER, aged about thirty, in the afternoon, was seized with shivering, and pain in his back and limbs. When I visited him, his skin was exceedingly hot, his pulse quick, full, and soft; and he complained much of head-ach, and thirst. The antimonial powder, No. 1, was prescribed, which puked him several times. His fever still running high, half a dose was repeated at bed-time.

On the morning of the 3d, the feverish symptoms continued, the decoction, No. 2, was prescribed, which purged him several times, and sweated him profusely. In the afternoon, his skin was pretty cool; his pulse 90; but he still complained of faintness and head-ach. A dram of bark was given every hour in a saline draught, which sat well upon his stomach. In the night, he had an accession of fever, and, contrary to directions, omitted his medicines.

4th. In the morning, his skin was hot, but a little moist, and his pulse 100. His eyes were red and watery; his tongue and teeth very foul; and he was troubled with the greatest anxiety and restlessness. A dram of bark was prescribed every two hours, and his drink was acidulated with crystals of tartar. At four in the after-

noon, he had taken five doses of his medicine ; and his pulse beat 115. At seven, he fell into a profuse sweat. The head-ach continuing severe, his feet were immersed in warm water. At twelve, he still sweated plentifully, the head-ach and thirst abated, and his pulse fell to 96. At night, he had taken an ounce of the bark ; it was therefore only prescribed every four hours.

5th. He sweated and rested pretty well in the night. This day his skin was perfectly cool, his pulse 80, and his tongue white and moist ; he had little or no thirst ; but complained of giddiness. As the bark began to purge him, he was advised to continue it every two hours, with tincture of opium, which he neglected. At four in the afternoon, he had an exacerbation of fever, with very great heat, head-ach, and thirst. At eight, he was in a profuse sweat, and his pulse beat 100. Two ounces of the bark decoction, with five drops of tincture of opium, were prescribed every two hours.

In the morning of the 6th, he was quite free from fever ; the redness of his eyes had disappeared ; but he was still very weak, feeble, and giddy. In the afternoon, his fever returned ; his pulse rose to 100 ; but his complaints terminated in a sweat. He took six drams of the bark in the day.

On the morning of the 7th, his skin was again hot, and his pulse a little frequent. In the afternoon, he had great thirst and was feverish for an hour ; but soon after, he fell into a profuse sweat. He took six drams of bark in the day.

On the 8th, he was free from fever, but was exceedingly weak, giddy, and faint. The bark was continued, and a bottle of red port allowed in twenty-four hours, in his sago, rice-gruel, and drinks. After this, he fell into

profuse sweats in the nights, which were removed by the bark and tincture of roses. On the 15th, he was able to return to duty, and soon recovered his strength.

CASE XV.

July 4th, 1771, lat. 6 deg. N.

JOHN CONNOR, one of the company's recruits, who was never before in a warm climate, on the second of this month, was seized at night with chillness, which was succeeded by violent head-ach, thirst, quick pulse, and other symptoms of fever. He got a few doses of the antimonial powder, No. 1, from my assistant, which sweated him profusely. Next day he was free from fever.

On the morning of the 4th, when I first saw him, his skin was moist and cool ; his pulse beat 90 ; his tongue was foul and furred ; and he complained of great giddiness and head-ach. Two scruples of the bark were prescribed every hour in port wine, which sate easy upon his stomach. At four in the afternoon, his skin became very hot, and his pulse beat 112 in a minute, soft, and small. At night, he was in an equable sweat, his pulse fell to 84, but he looked very stupid. He only took half an ounce of the bark.

5th. About one in the morning, he had two purging stools, was delirious, and refused his medicine. When I saw him, his skin was moist, his pulse beat 80, soft, and full ; he was very sensible, complained of great head-ach, and had strong pulsations in the carotid arteries. His head has shaved, and the pediluvium used ; the bark was continued, every two hours, in the saline draught, with a few drops of tincture of opium, to prevent it from run-

ning off by stool. At eleven P. M. his head-ach was more severe ; his pulse quicker and more feeble, and he seemed to be slightly affected with stupor.

6th. He dosed a little in the night, but had no refreshing rest. In the morning, he was perfectly sensible, but the head-ach and pains in his temples remained ; his pulse beat 96 ; his tongue foul, black, and furred. His temples were bathed with vinegar and water ; the pediluvium was used frequently ; and the bark was regularly continued. He was in a gentle moisture through the day ; at night, he was free from head-ach ; his pulse beat 84, very regular and soft.

He rested very well in the night and continued quite calm and free from fever. On the morning of the 7th, he was weak, feeble, and giddy, when out of bed. Port wine was allowed ; and the bark was repeated every three hours.

On the 8th, he continued to recover.

On the 9th, he went upon deck, and had a return of his head-ach ; and fever ; which soon again disappeared by the use of the bark.

After this, he was allowed a nourishing diet ; and was soon restored to his usual strength.

CASE XI.

August 28th, 1771, lat. 6 deg. 41 min. N.

ROBERT ENGLISH, carpenter's mate, aged twenty-three, very liable to fevers of a few days standing, when in a warm climate ; on the 27th of August, 1771, was seized with chillness ; violent pain in his head ; back ; and betwixt his shoulders ; and alternate flushes of heat

and cold continuing most part of the night. Four days before this he had been bled, and had taken two doses of salts, on account of an inflammatory gonorrhœa.

On the 28th of August when I was first made acquainted with his complaints; his skin was intensely hot, his head ached violently; his tongue was dry, and parched; his pulse beat 112, pretty strong, but soft. Half the powder, No. 1, was prescribed every three hours, which discharged much bile, and sweated him profusely.

On the morning of the 29th, he was still exceedingly hot and feverish. As the antimonial had not opened his bowels, a dose of salts was ordered, which operated well and relieved him considerably. About eleven at night, the feverish paroxysm returned with violence, during which he complained of great inquietude; his pulse beat 90, and was feeble, and oppressed: his feet were bathed in warm water, and lemonade was ordered for his common drink.

On the morning of the 30th, all the symptoms were mitigated; his pulse returned to its natural standard; and he only complained of great prostration of strength. A dram of Peruvian bark was prescribed at nine, which sat easy upon his stomach. In an hour, the feverish paroxysm returned; his head-ach became unsupportable; the muscles of the scapula, and almost universally over the body, were affected with spasmodic twitches. His pulse varied much, beating sometimes 90, sometimes 115, but was small, soft, and feeble. As he was in the greatest agony, a full dose of tincture of opium was given. After the use of warm fomentations, he fell into a profuse sweat, and found himself easy: he continued the use of the bark, and before night had taken about an ounce. About two in the morning, he had another accession of

fever, which continued three hours ; during which time his stomach rejected the bark.

On the morning of the 31st, he had a very distinct remission. His pulse beat 86 ; his tongue was sore, and covered with a black crust ; and he complained of the greatest prostration of strength, and dejection of spirits. A dram of the bark was continued regularly till twelve ; when he was seized with the most violent head-ach ; his eyes became dull and heavy, and his skin very hot. His pulse beat 96 ; he had continual twitchings of the muscles of the neck ; tremors, and twitchings of the tendons ; and complained of great dimness of sight. His feet were bathed ; a large blister was applied to the head ; an opiate prescribed ; and the bark was repeated, which sat well upon his stomach. The symptoms becoming more violent, his feet were frequently immersed in warm water, and he continued sensible. About nine at night, his head-ach remitted ; he saw distinctly ; and his skin was moist ; but the tremors still remained in a slight degree. As he had taken a large quantity of the bark in the day, two spoonfuls of the camphorated julep were prescribed every two hours.

September 1st. Towards the morning, he sweated profusely, and when I visited him, he was free from fever ; but was exceedingly weak and faint. His breath was offensive, and his tongue dry and black. He was allowed port wine ; and, in order to prevent another attack, he willingly continued the use of the bark. By twelve at night, he had taken ten drams, and was disposed to sleep. He rested well in the night.

On the 2d, his skin was cool, and he had little or no head-ach ; but complained of giddiness and dimness of sight, when he moved out of his hammock. He eat some

pumpkin tart at dinner ; and took a dram of the bark regularly every four hours,

For the three following days, he apparently kept recovering.

On the 7th, at night, when the weather was very close, he went upon deck, but was immediately ordered below.

From this to the 12th, he drooped much, was very low-spirited and dejected, and could not be persuaded to take his medicine.

On the 13th, his fever recurred ; his pulse beat 100; his tongue became sore, stiff, and swelled ; and aphthæ appeared in his throat.

On the 14th, a black crust fell off from his tongue ; and exposed to view several small ulcers. A gargle, with honey and barley-water, was prescribed.

From this to the 16th, little alteration happened. He only had been prevailed on to take from three drams to half an ounce of the bark daily.

On the 16th, he again appeared to be free from fever, but was exceedingly extenuated ; and reduced to the greatest pitch of weakness. The aphthæ in his mouth, and the soreness of his tongue remained. He had been allowed wine freely, which, now, he did not relish ; therefore, he was indulged in his desires, whether he called for a little punch or porter. He continued the bark, taking about three drams every day.

On the morning of the 19th, he was taken out of bed, conversed cheerfully, and seemed to be much better than usual. About eleven in the forenoon, in an instant, he found himself indisposed, and desired to be assisted to his hammock. He was seized with convulsions ; his extremities became cold ; he lay speechless, and had all the appearances of approaching death. A spoonful of cor-

dial volatile julep, was poured into his mouth frequently ; and bottles of warm water were applied to his feet. In three hours, he returned to his senses. After this, he became comatose ; and his pulse was very small, quick, and irregular. A blister was applied betwixt his shoulders ; the julep was given at times ; and he was supported with wine. His strength and spirits seemed now to be too much exhausted to expect any thing from medicines. From this time, the convulsive fits returned frequently.

On the 23d, he purged a considerable quantity of putrid bilious matter : he lay comatose ; insensible ; and died in the evening.

Upon opening the abdomen, the omentum was found very much wasted, but what remained of it was sound ; the liver was in a natural state, and the gall-bladder contained an ounce of dark-coloured bile. All the intestines seemed sound, except the duodenum, which was corrupted for several inches ; and contained some ounces of fetid matter, resembling a mixture of pus and bile. On examining the encephalon, the meninges, brain, and cerebellum, were of a natural appearance ; and the cortical and medullary substances were sound and bore handling better than in most subjects : but in the left ventricle there was found about half an ounce of bloody serum. The cavity of the thorax was not examined.

CASE XVII.

Canton, December 18th, 1771.

MR. AUDLEY'S servant, a young man of a healthy constitution, was seized with rigors, pain in his head and back, succeeded by a feverish paroxysm, which did not terminate in a regular remission. His surgeon had given

him an emetic and a purge. He was bled on the 17th of December, and some doses of emetic tartar were prescribed, which purged briskly.

On the 18th, I visited him along with Mr. Gowdie, surgeon of the *Horsenden* Indiaman, and we found him in the following condition. His countenance was very gloomy; and his eyes dull; his tongue black and furred; and his throat full of aphthæ. He complained of continual nausea; strong hiccup; and difficult deglutition. His pulse beat 120, strong and soft: he had frequent tremors, with twitchings of the tendons. Two ounces of bark decoction, No. 10, with tincture of opium, were prescribed every hour, which he retained; and he was ordered weak cinnamon-tea for his drink. At night, his pulse was very small and quick; and he became delirious. The pediluvium was used; and his medicines were continued. He was very insensible in the night; and towards the morning had two purging stools.

19th. In the morning, when we visited him, he lay comatose; but answered questions rationally, when roused. The aphthæ in his throat were more numerous, with a lard-like appearance on the top. His tongue was swelled and more furred; the twitchings and hiccup continued; and the tears ran off involuntarily; but his pulse was pretty firm, and beat 110. The bark decoction was continued, with half a dram of the powder. At night, he became insensible; his pulse was 118, and he swallowed with difficulty. He continued delirious in the night.

On the morning of the 20th, he lay calm and quiet; his pulse beat 100; the fauces and throat were more thickly covered with aphthæ; and his breath was fetid. The bark draughts, with tincture of opium, were con-

tinued ; his head was shaved ; and a detergent gargle prescribed. At night, his fever ran high ; and the hiccup was very strong. The bark decoction, with tincture of opium, was repeated, and fifteen grains of musk given in a draught at bed-time.

21st. Towards morning, he purged frequently. When we visited him, he was pretty sensible ; but his pulse was still very quick ; his skin hot ; his tongue dry and black ; his teeth and lips covered with a tenacious slime ; and the hiccup and twitchings of the tendons were more frequent than ever. The musk draughts, with ten drops of tincture of opium, were continued every six hours ; and, in the intervals, the bark decoction, with tincture of opium, was given as before. His medicines sat easy upon his stomach. Through the day, he was free from hiccup, and twitchings of the tendons ; and at night was in a warm diffused sweat.

22d. Last night, he had two purging stools ; and was insensible at times. In the morning, he was calm ; the hiccup was severe ; his mouth was very sore ; and he slavered much. As all the excretions were now very offensive ; the room in which he lay, which had been kept very cool, was ordered to be frequently sprinkled with vinegar. The musk and bark draughts were still continued.

From this time till the 25th, I did not visit him : the hiccup and twitchings of the tendons were less frequent : mitigations were still observable in the day-time : but, at night, the exacerbations of fever always returned, which induced Mr. Gowdie to give him a large dose of opium at bed-time, besides the tincture of opium in his bark draughts ; yet, notwithstanding, the periodical looseness

in the morning carried off a considerable quantity of the medicines he took in the day.

25th. The aphthæ appeared much more enlarged ; his tongue was swelled and ulcerated ; and the acrid saliva began to corrode the left angle of his mouth. His breath was exceedingly offensive, and his countenance very ghastly.

26th. He purged frequently ; and the ulcer in the corner of his lip bled at times.

27th. Petechiæ appeared on his neck and breasts.

29th. Large variegated spots, like bruises, were observed on his legs and arms ; and on his ancles, where blisters had been applied, there appeared slight mortifications.

30th. Sloughs, from the aphthæ, began to be thrown off ; the salivation still continued ; and as the ulcer in the corner of his lip became deeper, and looked worse, he was turned on the opposite side. For some days past, the hiccup and twitchings of the tendons appeared frequently. He took the musk draughts occasionally, and continued the bark decoction, with a little powder, and tincture of opium, regularly. His drink was cinnamon-tea, with red port ; and his strength was supported by a very free use of wine in his sago and panado. However, the periodical looseness still returned in the mornings.

31st. The right angle of his mouth began to ulcerate ; his tongue was very sore, but his fever had considerably abated.

January 1st. The petechiæ began to disappear ; the vibices were of a better colour ; and the aphthæ sloughed off. For two days past he had taken an ounce of the

bark in powder, and twenty-four ounces of a strong decoction daily, which he digested well.

On the morning of the 2d, he was seized with a very severe hiccup, and vomited and purged much viscid slime. When we saw him, he was much fatigued with the profuse evacuations; his pulse was small and fluttering; and he was sensible, but exceedingly dejected. The nausea, hiccup, and purging returned with violence. Judging these to be only symptomatic from foulness of the stomach and bowels, half an ounce of the tincture of ipecacuanha was ordered in separate draughts of chamomile-tea, which he got over with much gulping; but which operated, and brought up a considerable quantity of viscid slime and black sloughs.

3d. His pulse beat 84, and he was very free from feverish symptoms, but greatly exhausted. The vibices were almost all gone.

4th. In the morning the hiccup returned with violence: he puked and purged several times, and his pulse was so feeble as scarcely to be felt. The musk draughts, with tincture of opium, and the bark, were continued; and he was supported with wine. These complaints returned on the 5th.

6th. In the morning, the hiccup increased; and he vomited much black slime, which was very offensive. As the reaching to vomit continued, it was encouraged by a strong infusion of chamomile. After this, he was supported with mulled wine; and his extremities becoming cold, bottles of warm water were applied to them. The musk draughts, with tincture of opium, were continued; and the decoction of the bark sat easy upon his stomach the remainder of the day. At night, his pulse was pretty firm.

7th. The hiccup was troublesome at times, and never entirely left him till the 11th. The musk draughts, with tincture of opium, were repeated occasionally, which always procured sensible relief; and the bark decoction did not run off by stool.

From this time, he gradually recovered; however, his intellects were much disordered; and he was subject to very ridiculous fancies for some weeks: but as he regained his strength, his judgment returned.

On the 10th of February, when he sailed for England, his complexion was healthy: and, though still weak, he was in excellent spirits.

During the course of the fever, this patient took above fourteen ounces of bark in powder; and two pounds more made into decoction.

CASE XVIII.

Wampoa, December 17th, 1771.

MR. N——, on the 9th of December, was seized with a regular tertian. The paroxysms were severe; but, at first, the intervals were distinct. Having undertaken his own cure, by an insignificant prescription recommended by a friend, the ague changed its type, the remissions became imperfect, and it was accompanied with very severe quotidian exacerbations.

On the morning of the 17th, he was seized with slight rigors: and the paroxysm increased, with great heat and sickness at stomach. When I first visited him, at two in the afternoon, his pulse beat 120; his skin was intensely hot and dry; his tongue furred; he was comatose, and had slight twitchings of the tendons. Half the pre-

scription, No. 1, was given every hour. The stupor still encreased, and his countenance became wild and staring. At seven, he fell into a profuse sweat, which continued till twelve, but did not terminate the feverish paroxysm. A draught, with twenty-five drops of tincture of opium, was prescribed; and two ounces of a strong decoction of bark were directed to be given every hour in the night, and a dram of the powder, as soon as his stomach would bear it.

At ten next morning, he had taken eight ounces of the decoction and three drams of the powder. He was free from fever, but his head ach remained. A dram of bark was ordered every hour in port wine, which he continued regularly till night. By these means, a return of the fever was prevented, which in all probability, would have proved fatal; but, as he was still very weak, half an ounce of the bark was daily taken for some time.

22d. He was able to go to Canton; and was soon afterwards restored to his usual health.

CASE XIX.

May 21st, 1772, lat. 34 deg. 52 min. S.

JOHN CHANKPUR, on the 11th of May, 1772, was seized with a feverish paroxysm, which terminated by a profuse sweat. In the remissions, he was free from fever, but was afflicted with very severe head-ach. After the exhibition of an emetic, he took the bark in large doses, and returned to duty on the 15th.

After he gave over the bark, he found himself much indisposed; was low spirited; had frequent irregular shiverings; and unremitting head-ach.

May 21st. In the afternoon, when I visited him, his pulse was very small and quick; his tongue foul; his countenance sallow; and he was weak, giddy, and much dejected. A gentle emetic was prescribed, which relieved him considerably; but, as his skin continued hot, a draught, with antimonial wine and tincture of opium, was ordered at bed-time.

On the morning of the 22d, he was seized with rigors; complained of great prostration of strength and violent head-ach: his pulse was small and feeble; and the heat of his skin below the healthy standard. At eleven, his pulse beat 112, was very weak and fluttering: his extremities became cold, and he swallowed with difficulty. His feet were bathed in warm water; a large blister was applied betwixt his shoulders; and a spoonful of volatile cordial julep was given frequently. In two hours, he became warm, and fell into a gentle sweat; but still complained of great head-ach. A drām of bark was prescribed every two hours in red port. At night, he had taken six drams; his pulse was more firm, and beat 100 in a minute.

23d. He was pretty free from fever: his blister had operated well. The bark was continued; however, at night, his pulse was accelerated; his skin hot; and he had considerable thirst.

On the 24th, his skin was cool; his pulse natural; and the head-ach left him. The bark was continued; and he was allowed a pint of Madeira in the day.

On the 25th, he was free from every complaint, except weakness: his appetite began to return; and he was gradually restored to health.

SECT. II.

OBSERVATIONS ON CONTINUED FEVERS, ESPECIALLY ON THAT VARIETY ARISING FROM A VIRULENT CONTAGION*.

THE present practice, with a very few exceptions†, forbids the use of bark in continued fevers, till such time as considerable debility, or symptoms of putrescency come on; and then, it is said, if it be taken in proper quantities, that it will seldom fail in removing the disease. But the truth is, and I speak from attentive experience, that, if it be delayed so long, it will not only happen that the patient is incapable of taking it in proper doses; but that, by this time, such dangerous symptoms supervene, such as congestions

* Under this denomination are comprehended the Petechial, Hospital, Jail, and Ship fevers of authors.

† When the first edition of this work was published, no author in this kingdom had recommended the free use of bark in fevers, except the ingenious Dr Millar, of London. See his *Observations on the prevailing Diseases of Great Britain*, 1770.

In the summer and autumn of the year 1770, passing my time in Roxburghshire, during the interval of my voyages to the East Indies, I attended several persons in continued fevers; and, after cleansing the stomach and bowels, gave the bark, in the same manner, as in hot climates; and with so happy effects, that every patient soon recovered.

The same practice has been successfully followed by several physicians, whom I could mention, whose names would give great weight, although they have not published the result of their experience. Dr. Lettsom and Dr. Sims have also inculcated the early use of the bark, in their writings, without paying regard to intermission or remission of fever: and several other authors have adopted this practice, although they have confined it to that state of fever, which they have generically denominated *Typhus*.

to the head, and other *viscera*, which will render the effects of the bark, even suppose the patient's stomach be able to retain it in the most liberal manner, extremely uncertain.

In another publication * I have shewn the safety and advantage of exhibiting the bark early in continued fevers, which occurred in my practice in this kingdom. And, from 1770 to the present year 1791, I have attended about thirteen hundred patients, in all the varieties of continued fever; and do not remember that above four cases have come under my care where the medicine failed, when given *early*, and *regularly* persevered in. But I must also acknowledge that the bark has failed in many instances, when I have not been called in, and consequently could not prescribe it, till that state of the disease, when authors think its exhibition safe. How far the bark might have succeeded in the unfortunate cases †, had it been given early, is impossible to determine.

It is not, however, to my experience on patients alone to which I can appeal for the safety and advantage of giving the bark early in continued fevers: but I can affirm that, within these few years, my own life has been twice preserved by taking it largely and liberally, on the very first day of confinement in fevers; attended with

* *Observations on Fevers; especially on those of the continued type; and on the Scarlet Fever, attended with ulcerated Sore Throat, &c.*

† At the Dispensary, where an accurate register has been kept, the proportional mortality, in respect to the number admitted under my care, labouring under contagious fevers, is as *one to fifteen*; but in many of the fatal cases, the disease was too far advanced to give the least chance of recovery, before the patients were admitted.

such symptoms, as would have deterred many physicians from prescribing it. And, did I think it necessary, I could adduce the testimony of several medical gentlemen in this place, who have found equal advantage from it, when exhibited in the same manner, either in their own cases, in that of their relations, or patients.

But, in this section, I purpose to confine my observations to the means of subduing that variety of fever, which originates from virulent contagion. And when it is considered how often an infectious fever is either carried on board of ship, or generated in it; and how often the remittent fever, contracted at different harbours, becomes continual and contagious, I hope the following remarks will not be deemed foreign to the subject of this essay.

For eighteen years past having had frequent opportunities of attending the worst kinds of contagious fevers, as they have appeared in poor-houses: in persons who have contracted them on board of ships; and in the sordid and crowded habitations of the indigent; after pointing out the distinguishing symptoms, I shall briefly give a detail of the practice, which, if commenced in the beginning, seldom fails to subdue them, or, at least, to render their terminations favourable.

The continued fever from contagion, in the worst cases, is easily distinguished. The strength, from the very invasion, is prostrated; the countenance is dejected and much altered; and the eyes have a peculiar listless, and intoxicated look. Sickness, bilious vomiting, and diarrhœa, often accompany the most malignant cases; and the patients complain of giddiness, great debility, and faintness, on the least motion. Early in the disease the eyes become suffused, and look as if they were injected with a

mixture of yellow and red : the skin is often mottled with a dusky rash ; and frequently hemorrhages, *petechiæ*, and *vibices* make their appearance. Tremors of the hands, convulsive twitchings of the tendons, delirium, stupor, and hiccup come on ; and the patients sometimes die ^{so} early as the seventh, often on the eleventh, and still more frequently on the seventeenth day*.

Sometimes, indeed, the disease steals on by such slow and imperceptible degrees, that I have known those, experienced in other varieties of fever, deny that the patient ailed any thing except low spirits, till such time as stupor, convulsions, and delirium have come on ; and such other malignant symptoms, as have convinced them, when too late, that the distemper was incurable. The absence of heat, and quickness of pulse, indeed, in such cases, is apt to mislead those who have no idea of fever, except it be accompanied with strong action of the vessels. But still any person conversant with the debilitating effects of contagion, may readily ascertain the existence of the fever, by the very look of the patient ; although it is not easy to convey, in adequate terms, the changed and morbid appearance of the countenance.

The continued fever, arising from virulent contagion, is also often in the beginning attended with catarrhal affections, or slight peripneumonic symptoms ; which not only make the patient mistake his disease for a cold ; but this feature of the complaint also often deceives the un-

* In some cases which I attended in the advanced state of the disease, during its prevalence in Newcastle and its neighbourhood, the fatal period did not happen till the twenty-first, twenty-second, and, in one instance, the twenty-eighth day of the disease. But in all such cases the fever had crept on in a slow and insidious manner.

wary practitioner, who, by the use of the lancet, too frequently renders the distemper incurable.

But it is not my intention to enter minutely into the history of the disease, which is accurately described by many authors, under the names of jail, hospital, and ship fever*, I must, however, observe that it is still as frequent in large towns; that it is seldom out of Newcastle, for a whole year; and that it has been prevalent, during the winter of 1790, † and the spring and summer of 1791, amongst the poor; and also has been introduced, frequently, into genteel families; and, sometimes, even into those of the first distinction.

In order to subdue this fever, or to prevent its malignity, no time is to be lost: upon the very invasion, an emetic of ipecacuanha wine, or the powder, is to be given; and, as soon as the vomiting is over, immediate recourse is to be had to the bark, in the form of the decoction, No. 10, taking from two to three ounces every hour and a half, or every two hours; adding to every alternate dose from one to two drams of fine powdered bark.

An opiate also, when it agrees, ought to be given every night at bed-time, in a sufficient dose to procure rest. In great watchfulness I have found it to be the best plan, to

* See Sir John Pringle and Dr. Lind's works; and more especially Dr. Robertson's observations on the Ship Fever.

† This fever was generated in the poor-house of Gateshead, which is united to Newcastle by the bridge. For some time its ravages were confined chiefly to a low, ill-aired, narrow street, called Pipewell-gate. In September it made its appearance in Newcastle; and at first the contagion was easily traced from Pipewell-gate, and afterwards from one house to another. Of this fever 188 poor persons were admitted to the Newcastle Dispensary. The poor ill of the fever in Gateshead were attended by the parochial surgeon, and therefore are not included.

give forty, and sometimes fifty or sixty drops of tincture of opium to the patient, at his usual hour of going to rest; and to repeat twenty-five drops more, in an hour's time if necessary. But, in general, from twenty-five to thirty drops will be sufficient to begin with. The additions usually made to opium, when given to procure sleep, I consider of little importance. When there is no sickness, I generally give it in a draught with cinnamon water, and from forty to sixty drops of antimonial wine*; and, when there is a diarrhœa, I most commonly prescribe a draught with ten or more grains of Dover's powder, † adding to it a sufficient quantity of tincture of opium: the reason of this last addition is obvious; for a full dose of Dover's powder contains so much ipecacuanha, as often excites vomiting.

When the irritability of stomach is great, which is often the case, in contagious fevers, it is proper to give opium, and the compound tincture of bark, or colombo, in a saline draught, in the state of effervescence, and to repeat it frequently: and, when the sickness is allayed, to have recourse to the pleasant preparations of the bark, No. 7, 8, 9; still, however adding the powder, as soon as the patient can be brought to digest it.

In the advanced state of the fever, when great debility prevails, it is of consequence to add snake root to the bark, as in No. 12, or the volatile alkali, as in the prescription No. 13. And, in some cases of great sinking, I have, with advantage, added one or two tea-spoonfuls of æther ‡ occasionally to a dose of the decoction of bark.

When tremors and convulsive twitching of the muscles prevent the patient from getting rest, besides the use of

* Vinum Antimonii. Ph. Lond.

† Pulv. Ipecacuanhæ Comp. Ph. Lond.

‡ Æther Vitriolicus. h. Lond.

opium at night, it is proper to give it in small doses alone with the bark in the day time; as in the prescription No. 4. When opium agrees with the patient, and allays spasmodic affections and delirium, it ought to be continued: but, when there is great determination to the head, it ought not to be pushed too far; and, I cannot help observing, that I have seen the most serious consequences arise from the intemperate use of this medicine, in the latter stages of fevers, in the hands of the followers of a certain speculative theorist.

During the use of the bark, it is proper to keep the bowels regular, either by clysters, or the occasional use of rhubarb: but when a profuse diarrhœa happens, which is a most dangerous symptom in contagious fevers, it ought to be moderated by absorbents given in a large dose; and by the use of the warmer kinds of opiates, such as the *confectio opiata* of the London Dispensatory.

The hiccup, which is a very unpleasant and often a dangerous symptom, is most effectually mitigated by opium and æther, in the form No. 15, together with the application of a blister to the pit of the stomach. Musk, in this country, probably from adulteration, has generally disappointed my expectations, even when given in the largest doses.

Blisters I have found of little use in the beginning of contagious fevers, except when complicated with catarrh, or peripneumonic stitches; but, in the advanced state, they are very serviceable in relieving the head; especially when applied largely to each parietal bone.

When the pulse is low, the strength of the patient must be supported from the beginning with wine, porter, or ale: chicken broth; and beef tea*. But during the first

* In several states of fever, acescent drinks and nutriment are more proper, and better relished by the sick, than animal broths. But in

days, if the pulse be firm, the regimen should be temperate, though cordial : for I have seen great disadvantages arise from giving wine too freely in the beginning. From this, I would not have it understood, that I am an enemy to wine. Far from it. I think wine; malt liquor; spirits diluted; and punch, are indispensably requisite in the low state of this fever. I have often been obliged to increase claret, and sometimes even port wine, to the quantity of two bottles in the twenty-four hours; and have always persevered in the free use of wine, when it raised the pulse, disposed to rest, and diminished the delirium. But, on the other hand, if the symptoms increase upon the free use of wine; if the patient become more restless, furious or delirious, pushing wine to a considerable extent, has all the disadvantages which attend opium, in large doses, when there is much determination to the head; and, therefore, it ought only to be given in moderation, to support the powers of life; and not to heat the system. But, if the bark be immediately commenced with, there will be no necessity to give much wine, during the first days of the fever; and seldom occasion, afterwards, to exceed one pint of port, or one bottle of claret in the twenty-four hours.

During the course of contagious fevers, the patient's linen, and bed-clothes should be changed frequently, and fresh air should be freely admitted. His face and hands should be washed with cold water, every morning,

fevers proceeding from virulent contagion, and attended with great debility, broths are not only taken with pleasure by the patient, if given early; but are absolutely necessary to support the strength. And, however contrary it may be to theory, when made of fresh meat and cleared of all fat, they, along with the use of wine and bark, are powerful resisters of putrefaction. Upon such a diet, and course of medicine, the discharges of the bowels soon lose all offensive fætor.

and his feet immersed in warm water every evening. And when he is too weak to sit up, and is affected with stupor, and delirium, I have seen considerable advantage from fomenting the extremities with flannels wrung out of hot water, and vinegar; at the same time bathing the face and temples, with cold water, mixed with a little brandy.

When the fever is suppressed by the use of the bark, there still remains, in most patients, a tendency to relapse; and, therefore, it is indispensably necessary to continue the medicine, to, at least, six drains in the twenty-four hours, by way of security, for ten or fourteen days longer.

In order to illustrate the practice, I have followed in this variety of fever; which is essentially the same, in every part of the world, I shall insert a few histories of the disease, as it appeared, at Newcastle, in the year 1791: and would recommend the same management to be instantly adopted, in all the malignant continued fevers, in the East Indies; paying attention, at the same time, to remove corrupted bilious humours from the first passages.

CASE I.

A GENTLEMAN aged 47, after being much exposed to contagion, was, on the 26th of January 1791, seized with chillness; head-ach; universal lassitude; and debility. At bed-time he immersed his feet in hot water; drank some warm gruel: and perspired in the night: but he had no composed sleep; found his head confused; and was constantly and suddenly awaked by phantoms.

On the day following his head-ach and languor continued. His pulse was not accelerated: he had no appetite, and passed the following night in a restless state.

On Friday the 28th, during the whole day, he was harrassed with head-ach; chilness; great oppression; puffing of the stomach and bowels; and had a diarrhœa. He was obliged to get up, during the night, in the exercise of his profession; and, if possible, was resolved by every mental exertion to combat his complaint.

On Saturday the 29th, he was no better; and, being engaged, he sat up the whole of the night with a young lady, in the last stage of the fever.

On Sunday morning the 30th, he was seized with shivering, vomiting, and increased head-ach. His eyes now became suffused, and impatient of the light; and he had such a degree of muscular debility; giddiness; and faintness; that he was obliged to take to his bed, before mid-day. After the operation of an emetic, he took four ounces of the decoction of bark with tincture of colom̃bo, and repeated the same quantity every hour and a half, with one dram of the powder of bark in every alternate dose.

31. He passed last night in a restless state; had frequent twitchings and startings of the muscles in various parts of the body; his ideas were, at times, confused; and he had now and then flashes of light before his eyes. He however persevered regularly in the decoction and powder of the bark; and in the morning increased the last to two drams for a dose.

Feb. 1. He still had a restless night, and whenever he shut his eyes, notwithstanding he had taken an opiate, he saw strange objects; and was often troubled with convulsive twitchings of the muscles of the legs, arms, and shoulders. His urine continued pale; but he persevered regularly in the use of the bark, taking a pint and a half of the decoction, and two ounces of the powder, in twenty-four hours; which sat easy on his stomach; and

produced an equal warm perspiration. At bed-time, after bathing his feet in warm water, he took sixty drops of tincture of opium.

2d. He rested four hours last night. In the morning his urine was turbid ; his skin soft and moist. His head-ach, giddiness, and the twitchings of the muscles were still troublesome ; but he continued through the greatest part of the day in an equable warm sweat. He persevered in the use of the decoction ; and took one-sixth part of an ounce of fine powdered bark every three hours. And, as the quickness of his pulse had now subsided considerably, he drank about a bottle of claret, every twenty-four hours.

For the three following days, he had little fever ; slept better at night ; but his urine continued pale ; and he was very feeble and oppressed, except after taking wine and bark, which always gave fresh spirits. He still persevered in the bark, taking twelve drams of the powder, and a pint and a half of the decoction, every twenty-four hours.

On the fifth of February, in the afternoon, though very weak, he ventured to be carried out in a chair to visit a gentleman, who was taken ill of the same fever ; and who was anxious to have his advice.

For the three following days, he continued low, feeble, and at times faint : but he was obliged to be carried abroad daily.

On the 9th of February, his urine was again turbid ; but, in the afternoon, became pale. His pulse fluctuated from 90 to 100 ; and he was continually low and oppressed, except after taking bark, wine, or nutriment.

From this time to the eighteenth, he found a disposi-

tion in the fever to recur, notwithstanding he still took the bark, to near the quantity of one ounce daily.

On the 19th, 20th, and 21st days of February, his urine became exceedingly loaded, resembling milk chocolate; and from this time he rapidly recovered his strength, and usual spirits.

CASE II.

FOR this and the three following cases, I am obliged to Mr. Rayne, to whose friendly care, attention, and humanity, the recovery of the first patient is, in a great measure, to be imputed; as he was almost constantly with him, and ready to palliate dangerous symptoms as they arose. And, having attended all the patients usually twice a day, I can bear testimony to the accuracy of his relation.

“A GENTLEMAN, aged 23, was taken ill on the 27th of January 1791, but went abroad till the 30th, when he was obliged to take to his bed. His pulse then beat 100 pulsations in a minute; he complained of pain in his head, and back; weakness in his knees; and constant nausea, and sickness. An emetic was prescribed; but, having an aversion to medicines, he could be prevailed upon to take nothing farther than the saline draughts in the act of effervescence.

“His symptoms increasing, and his skin continuing parched, two grains of James’ powder, by the direction of his physician, were given every two hours, in the form of a bolus, on the 1st of February; and the effervescing draughts were continued.

“On the second of February, his urine was remark-

ably high coloured ; and he was threatened with a diarrhœa.

“ February 3d. His pulse was 120 ; and he had a low delirium : at six o’clock in the evening, he had a slight hemorrhage from the nose, which recurred at nine o’clock : ten grains of bark were added to the bolus with James’ powder.

“ 4th. During the night, he was, at intervals, delirious, and frequently sick and vomited ; and his skin continued dry, and harsh.

“ 5th. He appeared to be weaker. Pulse 120 : countenance dull and dejected ; his eyes heavy, and could not bear the light. His skin was still dry ; and he had so much stupor that he made few or no complaints. Dr. Hall and Dr. Clark met in consultation : four table spoonfuls of a strong decoction of bark, with the compound tincture, were prescribed every two hours ; with half a dram of the powder in every second dose. Wine, jellies, and chicken broth were ordered to be given freely ; and a draught with thirty-five drops of tincture of opium at bed time.

“ No material alteration could be perceived for the following six days. He persevered regularly in the use of the bark ; his strength was supported by wine, and nutriment ; and a diarrhœa was moderated by the occasional use of opium.

“ 12th. His diarrhœa recurred with so great violence, that, in the space of two hours, he passed nine liquid stools, the nurse having neglected to give an anodyne draught ; which was always left with her to exhibit occasionally. In the evening when the physicians visited him, his pulse was almost imperceptible ; and his strength was so much prostrated, that he did not appear

likely to survive the night. A gill of stored wine was given immediately ; and a draught, with one dram of aromatic confection, and forty drops of tincture of opium, was prescribed ; and another draught ordered to be given soon afterwards, if he did not fall into rest ; or if the diarrhœa recurred. The decoction of the bark, with the compound tincture, was persevered in.

“ For the three days following, appearances were more favourable ; and the fever began to subside : but, on the 16th of February, his fever recurred ; and his pulse which beat, for some-time past, at 108, rose to 120 ; his urine had a crude bilious appearance ; he became very deaf ; muttered often ; his eyes were impatient of the light ; his countenance dejected ; and he had a troublesome wheezing cough. Besides the decoction and tincture of bark, a draught with one scruple of musk, and fifteen drops of tincture of opium, was prescribed every eight hours.

“ On the 19th of February, a blister was applied between the shoulders ; and, the next day, he seemed more sensible. He persevered in the use of the decoction of bark, with the tincture, and occasionally the powder : the musk draughts were omitted.

“ On the 21st, his pulse beat 120, and was stronger, but he having a large loose stool, and the nurse neglecting to give him a proper quantity of wine, it became more feeble. A draught, with thirty-six grains of opiate confection*, was given immediately ; and another, with the addition of twenty-five drops of tincture of opium, was ordered at bed-time. He continued the bark decoction with the tincture, to which was added one, and

* Confectio Opiata, Ph. Lond.

sometimes two drams of the compound powder of crabs claws; and he took, at least, two bottles of port wine or claret in the twenty-four hours.

“On the 23d, his fever subsided, his pulse beat 108; and his urine began to deposite; but he often made it with difficulty. The palms of his hands became rough; and, afterwards, he had considerable desquamation of the cuticle.

“On the 24th, he complained of pain in the left arm-pit, and the axillary gland began to swell. His wine was, now, gradually reduced to the quantity of a bottle in the twenty-four hours.

“From this time, he began to recover gradually: but the pain and swelling of the axillary gland kept up a very considerable quickness of the pulse.

“On the 12th of March, the abscess in the axilla was opened, and discharged a very great quantity of matter; and from this time he rapidly recovered from a very reduced state, having no recollection of what had happened for above three weeks.

“During the course of the fever, he took seven gallons of the decoction of the bark, each pint containing three ounces of the compound tincture; and eighteen ounces of the bark in substance.”

CASE III.

“A YOUNG WOMAN, who waited upon the gentleman, whose case has been just narrated, was attacked upon the 8th of February, with weariness, head-ach, and a particular aversion to the light, (a symptom which all the patients, I attended, had, in a very great degree). Her pulse became 120, her thirst and inquietude

excessive. An emetic was given, and, as soon as its operation was over, she took one dram of the bark every three hours, in a cupful of the decoction, to each pint of which were added two ounces of the compound tincture. At bed-time she had a draught with two ounces of the decoction, and thirty drops of tincture of opium; and was desired to continue the former medicines, regularly in the night when she awoke.

“Feb. 9th. She had some rest in the night; was in a gentle perspiration during this day; but her fever continued. She was allowed a little wine.

“For the following days she had every appearance of doing well, her urine deposited a sediment; and her pulse subsided to the healthy standard: but, having given over the bark, or at least having taken only a trifling quantity, her fever returned on the 16th of February. She again had recourse to the medicine, and persevered in it regularly till the 24th, when every complaint left her, except weakness.

“This patient took ten ounces of the bark, and eleven quarts of the decoction.”

CASE IV.

“THE LANDLADY of the house, who had been much in the room with the patient, whose case has been related, No. II, on the 24th of February, complained of stricture over her eyes; shiverings; and weakness of her knees and legs, attended with a smart cough. Imputing her disease to catching cold, she went to bed and drank large quantities of wine whey to procure perspiration, but without effect.

“ On the 25th of February, her febrile symptoms increased ; her tongue was foul, and her pulse 112. In the evening, she took one ounce of ipecacuanha wine ; and at bed-time, a draught with two ounces of decoction of bark, and forty drops of tincture of opium. And, whenever she was awake, she was desired to take one tea-cupful of the decoction of bark.

“ 26th. The symptoms much the same ; the decoction of the bark was ordered to be continued, with one dram of the bark in powder in every alternate dose. Ten drops more of tincture of opium were added to the night draught, having had little rest, since the beginning of her complaint.

“ 27th. She had little sleep last night, having thrown up her draught. The head-ach and feverish symptoms the same. Pulse 120. She persevered in her medicines regularly. At night her pulse was 100, her head-ach abated, and her skin was soft and moist. An anodyne was given at bed-time ; and the bark ordered to be continued.

“ From this time her fever began gradually to abate ; and her urine to deposite a sediment. But, finding the bark to raise her spirits, and to give her new life, as she expressed it, she continued it till the 14th of March ; when her fever totally left her ; no particular symptom intervening, or any other medicine being requisite.

“ She took, during the course of her disease, thirteen quarts of the decoction, and twelve ounces of the powder of bark.”

CASE V.

"NURSE ———, aged about 65, came to attend the gentleman, whose ease has been related, No. II, on the 21st of February, and sat up with him every night during the remainder of his illness; finding herself much fatigued, she lay down in the same bed and bed-linen, which he had left for one more commodious in another room, and slept in it for several hours.

"Some days elapsed before she felt any inconvenience from this imprudent conduct. But on the 12th of March, the symptoms of fever appeared, which were perfectly similar to those of the landlady of the house*, on the first day of her complaint. Her pulse beat 112. An emetic was prescribed, and the decoction of the bark, with the tincture and powder as in the former eases, together with an anodyne draught at night.

"13th. No change. Her stomach bore the bark well.

"14th. Being threatened with a diarrhœa, a few drops of tincture of opium were, occasionally, added to the bark.

"15th. The diarrhœa ceased. Her fever continued with symptoms of great debility. She took her medicines regularly; but had the utmost aversion to wine, and every kind of nutriment.

"From this time to the twenty-fourth, she was frequently delirious in the nights; but in the day-time sensible. Her urine sometimes deposited a sediment; but was oftener of an amber colour. Although she could not be prevailed upon to take wine; and only used a

* See Case IV. page 188.

small quantity of brandy and water ; yet, as she did not appear to lose ground, and the symptoms were moderate, there was every reason to expect her recovery. But, on the 27th, she took a fancy to ride out some miles into the country, which the people about her, very ignorantly, allowed ; and she was brought back, exceedingly exhausted ; and almost dead with fatigue."

"From this time she had a constant stupor ; and was incapable of taking support or medicine ; and died on the 31st of March, being the 19th day of her disease."

This case I have introduced, because it was the only one which terminated fatally, where the bark had been timely taken, and regularly persisted in, which came under my observation, during the prevalence of this contagious fever. The medicine most certainly had the fairest trial ; for near ten quarts of decoction, and ten ounces of the powder were taken. A few days before she went abroad, I visited her. She was then perfectly sensible ; had every symptom of recovery ; and expressed a great desire to get out into the country ; but, as she was very weak, I advised her to take wine and support ; and not to think of leaving her house till she got more strength. After this I never saw her ; and my hopes of her recovery were frustrated in the manner already related.

CASE VI.

THE DAUGHTER of a publican, who humanely took a poor woman, who had just recovered from the fever into her house, in order to give her some food, soon afterwards found herself indisposed, and went about drooping for fourteen days.

On the 4th day of March, I visited her along with Mr. Humble. She had now been confined to her bed for nine days. Her countenance was dull, heavy, and dejected: her eyes yellowish, and much suffused. Her pulse was feeble, and beat 136. She had a low muttering delirium for some days past; and her skin was mottled with a rash, resembling the measles, when they begin to fade. Her urine was pale, and never had dropt any sediment. An anodyne draught was ordered at bed-time; and the decoction of bark to be given frequently.

5th. She slept a little in the beginning of the night, but, at one o'clock in the morning, became extremely delirious and unmanageable. Her pulse at nine o'clock beat 136; and she was deaf, and very stupid. A cupful of the decoction of bark, No. 10, was given, with ten drops of tincture of opium, as she was threatened with a diarrhœa; and it was ordered to be repeated every hour and a half, with one dram of bark in each alternate dose. In the evening there was no alteration for the better; she refused wine; but took the decoction regularly, which she retained; and as the powder was rejected, it was not persevered in. The anodyne draught, and the decoction were repeated at bed time.

6th. At one o'clock in the morning, she was seized with a severe shivering fit; and was, afterwards, insensible, and refused her medicines. In the morning, at eight o'clock, her countenance looked worse; her pulse was very feeble, and beat about 130. She had passed three loose stools in the night. I gave her a cupful of the decoction of bark, with ten drops of tincture of opium; and urged the absolute necessity of a regular perseverance in her medicines and wine. At night, she

looked better ; and her pulse was firmer. The anodyne draught was repeated at bed-time ; and her attendant was desired to give her medicines and wine punctually through the night when awake.

7th. She slept for several hours, at different times, through the night ; she took her wine and medicines well. Her pulse was firmer, and beat 120 ; and she seemed disposed to sleep, in the morning, when I visited her.

8th. She slept also much last night : but when she awoke, she bit the cup, when put to her mouth ; but drank every thing given to her. In the morning her pulse was 108 ; and her skin moist. She had taken a bottle of wine during the last twenty-four hours, and her bark regularly.

On the 9th, she was more sensible, longed for milk, which was given to her : and she passed a good night.

On the 10th, she was, at times, insensible, and sobbed much ; but took her medicines regularly, and her wine with pleasure.

For the two following days she was almost constantly asleep ; and, from this time, rapidly recovered from a very considerable state of weakness.

CASE VII.

THE SON of a pawnbroker, aged about 20, on the 16th of March, was seized with head-ach ; shivering ; and vomiting of bile. For this and the following day, he struggled with his complaint ; but was obliged to pass most part of his time in bed.

On the 19th, a diarrhœa and slight degree of delirium

being added to his other complaints, Mr. Leighton was sent for in the evening, who prescribed an emetic, and an anodyne draught ; and on the following morning, the bark.

March 20th. In the afternoon I first visited him. His countenance was flushed and dejected; and his eyes were dull, heavy, and watery. His pulse was small, feeble, and beat 106 pulsations in a minute. He had tremors of the hands ; his skin was a little hot, and thickly covered with the usual rash. His urine was high coloured with a bilious tinge ; he vomited at times and had a diarrhœa. Wine and the bark were ordered, with an anodyne draught at bed time.

21st. No alteration could be perceived. Except the draught, he had taken little medicine. As he was still threatened with the diarrhœa, four table spoonfuls of the decoction, No. 14, were ordered every hour and a half, with one dram of the bark in powder, in each alternate dose. The anodyne draught was repeated at bed-time ; but the tincture of opium was omitted in the decoction allotted for the night.

22d. He was in a warm diffused sweat ; and the diarrhœa had totally disappeared ; but he muttered much, and was frequently delirious.

24th. He was tormented with hiccup ; moaned much ; had frequently twitchings of the tendons ; and his eyes were more dull and suffused.

25th. He slept for two hours last night. In the morning the low delirium still continued. The rash began to disappear ; he was very deaf ; but the hiccup had very much abated ; and his pulse beat 120, soft and fuller. He had, now, increased his wine to one bottle and a half of port in the twenty-four hours.

26th. No alteration. Only he had frequent painful solicitations to make urine, which was sometimes pale, and sometimes of the colour of amber.

27th. He rested well last night. In the morning, he was, at times, sensible; his pulse beat 112; his urine became turbid, and, at night, dropt a cretaceous sediment.

28th. He passed a tolerable night. He had two motions of the bowels: in other respects, he was exactly the same, as yesterday.

29th. The anodyne draught was neglected; he passed a bad night; and the diarrhœa recurred. In the morning he appeared much exhausted. A warm anodyne draught was prescribed; and another kept in readiness to be occasionally given. The bark, which he had taken regularly, was ordered to be persisted in.

From this time, he fell into long and composed sleeps. His senses, and appetite, particularly for wine, returned; and, from a state of great debility and emaciation he was speedily restored to health.

During the course of his disease, he took twenty-three pints of the decoction, and twenty ounces of the powder of bark.

The house maid, who was the only person from whom he would take his medicines, was seized with every symptom of the fever; but its formation was prevented by the use of an emetic; and sweat: she afterwards took a small quantity of the bark.

CASE VIII.

————, aged 25, the superintendant of a sail cloth manufactory, where many of the spinners had laboured under the contagious fever, was seized, on the 23d of March, with head-ach, chilness, giddiness, and great oppression of his breast and stomach.

On the following day, he was confined to the house : he became affected with tremors in his hands : staggered when he attempted to walk ; his eyes became dull, and, as the family expressed it, his countenance looked as if he had been in a state of intoxication.

March 25th. Though weak, feeble, and giddy, he sat up most part of the day. In the afternoon he took an emetic. Had a slight hemorrhage from the nose. An anodyne draught was prescribed at bed time.

March 27th. He had a laxative, which produced three evacuations. In the evening I visited him along with Mr. Leighton. His countenance was flushed, bloated, and stupid. He had constant tremors. His pulse was 100 ; and his skin was mottled with the rash. He complained of head-ach ; and said he had got no sleep for several nights. The same medicines were prescribed as in the former case.

28th. He slept none in the night. His eyes were exceedingly dull and much suffused ; and the tremors were almost universal. He was very full of the rash ; had a constant muttering delirium ; and the hemorrhage from the nose returned.

29th. He again bled from the nose ; and, when taken out of bed, fainted. He was constantly, through the whole day, affected with universal twitchings and tremors.

He had a low muttering delirium ; and was often under the influence of stupor, but got no refreshing sleep. The hemorrhage from the nose returned at night.

For the four following days, he had almost constantly convulsions and tremors ; and his countenance was exceedingly ghastly. His pulse, however kept up ; and he took his wine and medicines regularly.

April 4th. He slept well in the night. In the morning his pulse was 108, and his urine deposited a sediment, for the first time ; but the twitchings of the tendons were still frequent.

5th. His senses began to return. He had a great desire for food and wine : and the rash began to fade.

6th. He slept well in the night. Tremors almost gone. Pulse 84.

7th. Pulse 84. Tongue clean ; and his eyes began to regain their lustre ; but he still had tremors.

From this time he began to recover daily ; his urine became loaded ; and deposited thick flocculent sediment. But, as he was extremely reduced, and had considerable desquamation of the cuticle of the hands and arms, his medicines were continued till the 20th of April, though less frequently repeated.

Whilst the convulsive twitchings and tremors continued, he had a draught with opium generally twice in the day. Mr. Murray, a very intelligent surgeon, his intimate acquaintance, was almost the only person, he would take either wine or medicines from, during the most dangerous state of the fever ; and, owing to his great care and attention, the recovery of the patient is, in a particular manner, to be imputed.

During the course of the fever, and convalescent state, this patient took seventeen pints of the decoction of bark,

including the tincture ; and seventeen ounces and three drams of the powder.

CASE IX.

A YOUNG WOMAN, who waited almost constantly on the last patient, notwithstanding she took a dose of the bark thrice a day, after being indisposed for some days, on the 6th of April became so feeble and faint, that she was obliged to take to her bed. In the afternoon, when I saw her, she had been sick ; vomited bile ; and complained of great weakness, and head-ach. Her pulse was very feeble, but little quicker than natural ; and her body was mottled with a general rash. Her countenance was dejected ; and her eyes extremely dull. An emetic, and an anodyne draught were prescribed ; and the bark was ordered to be taken to the quantity of one dram every two hours.

April 7th. She passed a very restless night ; her pulse this morning was 90, and very feeble. Her eyes were suffused, and her countenance had the usual dejected appearance. She had slight tremors of the hands ; and was giddy and faint in an erect posture. She took the bark regularly through the day : but, having used little wine, she appeared very languid at night.

From this time, she took about a bottle of wine in the twenty-four hours ; persevered regularly in the use of the bark, and anodyne draught at bed-time. On the 9th, she slept tolerably well in the night : and in the morning was in a warm diffused perspiration. The rash began to fade ; her pulse fell to 80, and became firmer. Next day her countenance began to assume its natural look ;

her fever was soon subdued ; and she was speedily restored to health.

CASE X.

A YOUNG LADY, aged about twelve, of a delicate make, and weak constitution, on the 8th of May 1791, was seized with a profuse hemorrhage from the nose. On the following day I visited her along with Mr. Leighton. Her pulse was 118 ; the hemorrhage had continued with little abatement, and the blood was thin. Her legs were thickly covered with duskish petechiæ, and she had a great number of purple spots on various parts of her body, and a few vibices resembling small bruises, upon her legs and thighs.

In a case attended with such alarming symptoms, no time was to be lost. She was therefore directed to drink lemonade, with port wine for her common drink ; to eat oranges freely ; and to support her strength with acedent food, and broth. Two drams of the American extract of bark were ordered to be dissolved in the decoction, No. 9, and four table spoonfuls to be given every hour and a half ; with half a dram of bark in powder, and five grains of alum in each alternate dose. An anodyne draught was, also, prescribed at bed-time.

Notwithstanding the patient complied most punctually with every direction, yet ; for several days, the petechiæ continued of a duskish hue ; and the purple spots and vibices increased in number. Her breath also became offensive ; and her pulse rose to upward of 130 ; but, except at nights when she muttered much, she kept free from delirium. The blood continued to ooze from her

nose, in considerable quantity, and, also, from two pustules on the inside of the lower lip; and the blood was so thin as scarcely to tinge the cloths on which it was received. When the hemorrhage was stopt at the nose, blood either appeared in her urine, or stools, which were very fetid.

On the 16th of May, the petechiæ and vibices began to disappear: her pulse became stronger; but blood, though in lesser quantity, was still at times discharged either from the nose; the lip; the urinary passages; or the bowels. But, as the patient took her medicines and nutriment regularly, and, besides oranges, generally used two or three lemons daily, we began to entertain hopes of her recovery.

By the 20th, the petechiæ and vibices were almost totally gone. Her pulse was reduced to 110. Though extremely weak, she was able to sit up; the hemorrhages had left her; and her appetite became keen.

From the time I visited her, to the 22d of May, she had taken twelve pints of the decoction No. 9; seven ounces of the bark in powder; two ounces and six drams of the South American extract; and one ounce of alum.

The alum was omitted on the 22d of May, but the decoction No. 9, and the powder of bark was continued for the sake of security.

- For ten days longer she had every appearance of a certain, though slow recovery. But, on the first day she was allowed to take an airing, being disappointed in procuring a chaise, her attendants permitted her to walk out in the heat of the sun, in a very sultry day. Although they supported her, and she did not walk far, yet she became extremely feverish at night; and the hemorrhage from the nose recurred with violence.

On the following morning, some purple spots and a few petechiæ, again made their appearance; which were soon removed by the treatment adopted in the beginning of her complaints. But her pulse rose to 136; a cough was added; and, for several days, a very considerable quantity of blood issued either from the nose; the urinary passages; or the bowels.

But, by a steady perseverance in her medicines and regimen, the hemorrhage was, at last, subdued. However she was reduced to the utmost pitch of weakness, and seemed likely to become hectic.

At the end of seven weeks, reckoning from the first attack, though extremely emaciated, she was conveyed into the country for the benefit of goats' whey. In a very short time her cough was so much relieved, and her strength improved, that her father judged it proper to take her home to his residence in Edinburgh.

I shall conclude these observations on the treatment of contagious fevers, with the following remarks. From a retrospect of all the cases which have come under my care, the recovery appears to have been, almost, in exact proportion to the time in which the bark had been given. When it was prescribed early and liberally, and no mismanagement happened on the part of the patient, the fever was, commonly, soon subdued, or its danger averted. But, in the worst cases, if the disease was neglected only for a few days, derangement of the nerves and *engorgement* of the brain* frequently took place, which prevent-

* When *engorgement* of the brain takes place, to any considerable degree, in fevers, no medicine, which has hitherto been recommended, is capable of removing it. And therefore, I hope, I shall be excused

ed the effects of the bark and every other medicine. Some, indeed, when the disease was very far advanced, experienced a happy change, when they could take the

for proposing mercury, (the only medicine which has been found adequate to remove obstinate congestions in the other viscera) in such a deplorable and dangerous situation. But, at the same time, I confess, I am not able to point out the particular cases to which this practice will apply, from not being able, certainly to distinguish *engorgement* of the brain, from mere *irritability* of that organ; the symptoms in both being similar. Nor have I tried the practice in so many cases, as to enable me to speak of it with much confidence.

In such cases, calomel is the preparation which I have used; and to prevent it from running to the bowels; and also to allay irritation, I, always, conjoin it with opium; and, unless a diarrhœa be present, a cautious trial of such a medicine can be attended with no disadvantages. If the case depend, merely, on irritation of the brain, the opium will soon relieve it, and the calomel may be omitted: if congestion be the cause, it will be proper to push both articles farther, with care and circumspection.

In order to elucidate the practice, I have mentioned, I shall subjoin the following history, in which the symptoms of determination to the head happened early in the disease; which was also the case, in all the other instances, where I have ventured to give mercury.

A GENTLEWOMAN, after being indisposed for some days with irregular shiverings, and severe head-ach, was obliged to confine herself on the 20th of December 1790. On the 21st, I visited her. Her pulse beat about 100: the heat of her skin was little above the temperature of health; but her countenance was dejected, and she complained of sickness, and severe head-ach; and at times vomited acid matter. She was not sensible of having got any sleep for some nights past. A mixture with magnesia was ordered; and three grains of calomel, and one grain of opium in pills at bed-time. On the 22d, having a pain in her side, a blister was applied: no blood was taken as her pulse did not require it. On the 23d, she had a low muttering delirium; her countenance was more dejected; and she vomited bile frequently, notwithstanding the use of the saline draughts in the state of effervescence. On the 24th, the irritability of stomach was greater, and the pain very

bark freely ; but, in many cases, coming under this description, although the patient wrestled through the distemper by its assistance, the recovery had more the appearance of an escape than a cure.

Upon the whole, whoever wishes to be successful in preventing the fatality of fever, must commence early with the bark, before much debility has taken place : and, although this practice does not promise infallibility, yet, it may be affirmed, that if regularly persevered in, much fewer will die of this, than of any other disease of importance ; even where the method of treatment is established by the unanimous consent of physicians.

SECT. III.

OBSERVATIONS ON INTERMITTENT FEVERS.

THE common mode of practice, which limits the use of the bark to the intermissions of fever, although it insufferable. Nothing afforded relief, nor was long retained, except, the calomel opium.

For five days following, she had a constant delirium ; picked and gathered much about the bed cloths ; and often searched for pins both in the bed and in her mouth, which she maintained were full of them. Her pulse was small and frequent ; her urine, sometimes pale, sometimes high coloured ; and her eyes were suffused. She had a blister applied to the nape of the neck, which, however, seemed to be attended with no advantage. The calomel was continued, with opium at bed-time. On the 31st of December, she returned to her senses, and complained of her mouth being sore. She had taken, in all, thirteen grains of calomel. The tenderness of the gums continued for a few days. Her urine deposited largely ; and, by the use of the bark, she was speedily restored to health and strength.

answers very effectually in tertians and quartans; yet, in quotidians, and double tertians, where the intervals are short, and often incomplete; is attended with insuperable disadvantages. The few hours of intermission, in such cases, afford no time to throw in a sufficient quantity of bark to prevent the recurrence of the paroxysms. The disease in consequence is aggravated; and, from the only medicine being withheld, which can give security, very frequently, terminates fatally.

The experienced Dr. Lind observes, "That, when the ague was stopped by the bark, after the first or second fit, as in his own case, and in those of two hundred of his patients, neither a jaundice, nor a dropsy ensued. When the bark *could not* be administered, on account of imperfect remissions of fever, or when the patient had neglected it, either a dropsy or a jaundice was the certain consequence; and the degree of violence, with which it attacked, was in proportion to the number of the preceding fits, or the continuance of the hot fit. By every paroxysm the dropsical swellings were increased and the colour of the skin rendered of a deeper yellow*." This eminent physician, who has contributed so much to the alleviation of the sufferings of patients afflicted with intermittents, by establishing the efficacy of opium in the paroxysms, still retains the common opinion, that the bark can only be given with safety in the intermissions. But, in dangerous intermittents, where the apyrexia is short and imperfect, confining the bark to the intermissions alone, amounts almost to the same thing, as to a prohibition of its use: and experience has convinced me, that its exhibition in the paroxysms is not

* Lind on Hot Climates, 3d Edition, Page 291.

only perfectly safe, but attended with the greatest advantages.

Whilst I resided at China, in November, 1771, intermittents were prevalent, as has already been mentioned*. The interval free from fever was often of very short duration; and the paroxysms severe, and attended with alarming symptoms. After cleansing the stomach and bowels thoroughly, I immediately commenced with the bark; and continued it regularly in the paroxysms. An opiate, after the end of the cold stage, was necessary to prevent irritability of the stomach, as well as to mitigate the hot fit. By this procedure the danger was averted, and the disease speedily cured; whereas I could adduce several instances, when bark was only given in the usual mode, from the end of one paroxysm to the beginning of another, where the disease either proved fatal, or the recovery tedious.

Having ascertained the safety of administering the bark at every period of intermittents, I was induced at China, and afterwards in this country, to try its effects in the paroxysms only. I began by giving two drams at the accession of the fit, and repeated the same quantity in the middle of the paroxysm. This plan generally succeeded in removing the disease, with a very small quantity of the bark; and the only disadvantage I ever observed to follow, was that the dose, taken in the cold stage, was frequently rejected. I, therefore, soon altered the above method, and exhibited two drams of bark, two hours before the recurrence of the paroxysm; and, when the cold fit was over, I gave an opiate, and, as soon as the sweat began to flow, other two drams of the bark.

By this management the medicine is easily retained : and the disease removed by half the quantity, which is required when it is given in the intermissions only.

Although this method of prescribing the bark, may be attended with very great advantage, in saving a medicine, which, in particular situations, cannot easily be replaced; yet, in quotidians attended with danger, it will be advisable to give it also in the intermissions of fever. But, after the fits are stopped, two drams of the bark, given at the time when the rigors were wont to make their appearance, and the same quantity four hours afterwards, will be sufficient to prevent a relapse; and, after a few days perseverance, the dose may be reduced to one dram.

When agues are simple, and not complicated with any other disease, I never saw the bark when given early and liberally, fail to cure them. But, when from neglect, the patients suffer them to run on, they often become extremely obstinate. In such cases, even where there have been no symptoms of visceral obstruction, I have found a few doses of calomel, given every night, with opium when it proved too purgative, remove the cause, which had rendered the distemper rebellious; and, after resuming the bark, the disease has been speedily subdued by a very inconsiderable quantity.

But when agues, by their long continuance, have brought on visceral obstructions, threatening a fatal termination under the appearance of jaundice, or dropsy, nothing can rescue the patient from impending destruction, except a judicious course of mercury. Such deplorable instances, are often to be met with in the East Indies; and every year, since my residence in Newcastle, has afforded me an opportunity of attending some

patients returning from Lincolnshire and other fenny countries after the harvest, reduced to the utmost pitch of weakness, by the continuance of obstinate intermittents. By the use of mercury* the most formidable obstructions were removed; and I do not recollect a single patient in whom the ague was not soon afterwards subdued by a moderate use of the bark. To illustrate the practice, which has been recommended, I shall subjoin the following case.

JOHN KIRKUP, aged 21, was admitted to the Dispensary on the 16th of March, 1784. He had laboured under a quartan intermittent for six months, with which he was seized in the shire of Cambridge. For the first four months he took no medicine: but for the last two months, being an in-patient of the infirmary, the bark was administered in large doses, without stopping the paroxysms.

About three months ago his abdomen and legs began to swell. He was now very much emaciated. His legs, thighs, and belly were very much swelled; and he voided his urine in small quantities. His pulse beat 120; he had a very severe cough; and was dismissed from the infirmary as not likely to receive benefit. Although his case, indeed, appeared hopeless, I was induced to try the effects of mercury, which I had often found successful in similar, though less dangerous, cases. Four grains of calomel, with an anodyne draught, were administered every night at bed time; and six spoonfuls of the alkaline infusion, No. 17, thrice a day.

March 19th. The anasarca swellings were consider-

* Calomel is the preparation of mercury I have commonly prescribed in such cases; but, if it ran too much to the bowels, the pills No. 16, or inunction was substituted.

ably reduced, and he now began to void urine freely. The intermittent had changed from the quartan type, and he had a paroxysm every day since he began the use of his medicines. The cough continued without abatement; and, for the last twenty-four hours, he complained of a severe pain in the epigastric region. Upon examination considerable fulness and hardness were perceptible to the touch; extending from the right hypochondrium, over the whole epigastrium. A blister was applied to the part affected; two grains of calomel were ordered every night at bed time; and a draught, with antimonial wine and tincture of opium, every day at the attack of the hot fit, with a view to mitigate the paroxysm.

March 25th. I visited him daily since the last observation. The paroxysm came on later every day, and continued only for two hours. His appetite began to return, and he daily recruited some strength. The dropsical swellings were removed. He was now free from pain, but the region of the liver felt hard. His mouth being affected with the mercury, which he had continued regularly, its use was now suspended. The anodyne draught was continued; and the bark was prescribed every two hours in a saline draught.

March 30th. He has had a moderate salivation, and his mouth still continues sore. He has had no return of the paroxysm since he began the bark. His pulse is now 100. Every symptom of abdominal obstruction is removed; and he daily gains strength and spirits.

April 9th. Since the last observation he went abroad daily, and recovered very rapidly. But, for a few days past, having omitted the bark, the ague recurred; and his abdomen has again become tumid. Two grains of

calomel were ordered every night at bed-time, and two drams of the bark, before the attack of the cold fit, with two drams more in the middle of the paroxysm.

The calomel was continued for six nights in succession, occasionally with opium, which removed the tumor of the abdomen. The bark speedily prevented the return of the fits of the ague: and, on the 10th of May, he had perfectly recovered his usual state of health and vigour.

In the year 1785, spring intermittents were unusually severe, and generally of the quotidian type, with short and imperfect intermissions. Besides the use of an anodyne at the beginning of the hot fit, a few doses of calomel, at bed-time, were productive of great advantages; and, afterwards, the disease soon yielded either to the red or common bark; but it often was necessary to give two drams of the latter for a dose.

With respect to the question, whether the red bark possesses a superiority over the common bark in curing agues, provided both be equally genuine, it is no easy matter to decide? With the common bark I have found no difficulties, when given in large doses. But red bark of the first importation in 1779 removed agues, given in doses of about half the quantity, which were required, when the common bark was prescribed. I was however sometimes obliged to give over the red, and have recourse to the common bark, on account of the former occasioning vomiting and purging.

The red bark, for some years past, being either adulterated, or of an inferior quality, has lost much of its reputation: and common bark has again acquired, at least in this place, a decided superiority.

The new extract of bark, prepared in South America*

* See an account of a new extract of bark prepared in South America. LONDON MEDICAL JOURNAL for 1790. Part I.

appears to possess the sensible properties of the bark in a concentrated state. I have tried it in agues, in divided doses from two to three drams, in the interval of the paroxysms; which sometimes succeeded, but oftener failed. Its efficacy is much improved, when two drams of the extract are dissolved in ten ounces of the decoction of bark whilst hot; and to render the solution more palatable, it may be flavoured with spirit of cinnamon, and made into an emulsion with almonds triturated with sugar. This *formula* taken to three or four spoonfulls every two hours, will often remove agues in children. But in the quotidians of adults, which have been prevalent this summer, two drams dissolved in a pint of strong decoction, warmed with the compound tincture of bark, taken every twenty-four hours, have often failed in removing the fits; and the cure with it has always been tedious. This extract, therefore, must never be depended upon in cases of danger; but recourse must be had, at the same time, to the powder, as soon as the stomach will bear it.

Before taking leave of this subject, I shall offer a few remarks on the arsenical solution. After perusing so respectable testimonies, in favour of the efficacy and safety of arsenic in agues, by Drs. Fowler, Arnold, and Withering, I began to prescribe it. My views were to save expence to the Newcastle Infirmary and Dispensary, and to ascertain, by personal experience, whether or not it might be recommended as a substitute for the bark, in situations in the East Indies, where the latter cannot always be procured.

The form of the arsenical solution,* I prescribed, dif-

* R. arsenici albi in pulverem subtilissimum triti grana sexaginta quatuor;

ferred only from that recommended by Dr. Fowler, in omitting the spirit of lavender, which I supposed might occasion some precipitation of the arsenic, and in substituting nitre for the alkaline salt, which, with the cochineal, gives the preparation a good colour. This solution I gave to twenty-five adult patients in the Infirmary, labouring under tertians and quotidians, from eight to ten drops twice, and sometimes thrice, a day, in a cupful of barley water; and, in two instances, the dose was increased to sixteen drops. Of this number only twelve patients were cured. In the remaining thirteen patients, the solution having no effect in suppressing the fits, the bark in powder soon removed the disease. Another physician to the Infirmary gave the solution a fair trial in eighteen patients; and of this number only eight were cured. But to do ample justice to the solution, I must not conceal, that two patients of other physicians were cured by it after they had prescribed the bark in vain.

At the Dispensary, I prescribed the solution to several patients, in the form of julep, of which every half ounce contained the number of drops allotted for one dose. One table spoonful was given in barley water twice or thrice a day. Sixteen were cured, but the number of the cases in which it failed cannot be ascertained, from the register not being kept accurately; and from the patients not

Salis Nitri drachmas duas;
Coccinellæ grāna decem,
Aquæ distillatæ libram dimidiam.

Inmitantur in ampullam florentinam qua in balneo arenæ posita; aqua lente ebulliat donec arsenicum perfecte solutum fuerit, deinde cola per chartam et adde: Aquæ distillatæ libram dimidiam, plus vel minus, adeo ut solutionis mensura libra una accurata sit, vel potius pondere unciarum quindecim cum dimidia

having all returned the letters of admission on which the prescriptions were entered.

To several surgeons in the neighbourhood, who live in situations where agues prevail, I recommended a cautious trial of the solution. All of them spoke favourably of the medicine; although they allowed that it often failed. But their reports, being only made from memory, afforded no decided proof of the comparative advantages resulting from this practice. And as their patients consisted generally of the laborious poor, who, from the narrowness of their circumstances, as well as from prejudice, seldom give the bark a fair trial, the comparative success of the solution, to gentlemen in such lines of practice, will ever appear favourable. But, when their patients took the bark liberally, none of them made complaints of meeting with disappointment in agues, unless complicated with other disorders.

When the continuance of agues had brought on much weakness, I seldom, in such cases, tried the solution as, according to expectation, it failed in two debilitated patients. In all the cases in which I exhibited the arsenic, no other disadvantages arose, than sometimes sickness, griping, and purging: and, in a few instances, a swelling in the face and over all the body, which soon disappeared on discontinuing the medicine. But from producing such violent effects, I have little doubt, if the solution be persevered in, after the griping and swelling appear, that death would follow from the gradual accumulation of this poison in the body, even when given in small doses*. And, therefore, I would recommend

* Since these sheets were prepared for the press, I have been favoured with the following communication from an ingenious medical friend; whose candour and humanity have allowed it to be published.

all who may venture to prescribe the solution, to exhibit it in draughts; or in a julep containing a few doses, and to attend carefully to its operation.

“Should the following observations upon the use of the arsenical solution be deemed by you of service, either in shewing the efficacy of the remedy, or in warning others from an incautious exhibition of it, I freely give my consent to your making whatever use of them you may think proper.

“The cold easterly winds, prevailing in the months of April and May 1790, gave most of the complaints of that season, the intermittent or remittent type. The former, in some parts of the country, were so common as to be epidemic; and, upon more minute inspection, one might easily trace contagion as one of the causes of the complaints. In a work of importance in the neighbourhood, this disease raged with such violence, as to raise serious alarms for the consequences. My attendance being requested, I had an opportunity of observing the progress of the disease, and the efficacy of Dr. Fowler’s remedy for its cure. At my first visit I found whole families attacked with the complaint, and no sooner had it entered a family, but the wife took it from her husband, and communicated it to her children.

“The number of patients I had, and their aversion to take the bark, induced me to give the solution as recommended by Dr. Fowler. I previously exhibited an antimonial emetic, which commonly evacuated a large quantity of bilious *sordes*, that lodged in the stomach, rendering it extremely irritable, and the bowels inert. Afterwards, in the first paroxysm, an opiate joined with a few grains of calomel, so as to render the intestines open, was the general mode adopted, before administering the solution; which was then ordered to be taken three or four times a day, in doses according to the age of the patient, or as the urgency of the symptoms required. Out of an hundred cases there were only four which resisted this remedy. One of them had, previous to his being seized with the complaint, lost a great quantity of blood from an accidental wound: the other three had removed from a more healthy part of the country, to a marshy unwholesome situation. The bark was then given which cured them all except one; who after having tried, without effect, several remedies, was recommended to change his situation; which he did for a fortnight, and was perfectly cured.

Upon the whole the arsenical solution, (from the result of my own experience, and even from the report of the physician*, who, in this country, has contributed to extend its use) can in no degree be compared with the bark in point of efficacy. I therefore must forbear to recommend it as a substitute for the bark, in unhealthy situations of hot climates, where agues soon induce great debility, which will ever require the use of this last invigorating febrifuge to subdue them.

“ I cannot conclude without mentioning one case which terminated unfortunately from pursuing the use of the medicine too far. A boy, aged twelve years, after having taken the preparatory remedies, had a phial of drops sent him, composed of half an ounce of the arsenical solution, and the same quantity of tincture of lavender, of which he was to take from ten to twenty drops four times a day; with a strict caution to his parents to desist, should his face swell, or sickness and griping come on. This advice being neglected, and the use of the drops persevered in after his face was swelled, brought on also a swelling and puffiness over the whole body; attended with violent griping, nausea, and vomiting. Allowing him to remain in this state for two or three days, and not finding him likely to get better, they acquainted me with his situation. Upon visiting him his appearance was terrible indeed: the whole cellular membrane seemed blown up, the scrotum livid, the internal parts to be similarly affected, and the fauces so much enlarged as to resist the passage of liquids; the pulse fluttering, with heat, stupor, and in short every appearance of approaching death. Both external and internal *stimuli* were applied in vain: a few hours more finished his existence.

“ This case has made me more cautious in the administration of this medicine to the poorer class of patients; which I now do, in a more diffused vehicle, with equal success, and greater safety.”

* Dr. Fowler who managed the arsenical solution with great judgment and caution, gave it to two hundred and forty-seven patients labouring under intermittents, of whom one hundred and seventy-one were cured. See *Medical Reports of the effects of arsenic*, &c.

CHAP. III.

OBSERVATIONS ON THE DYSENTERY.

NEXT to fevers the dysentery proves most fatal to Europeans in the East Indies. This disease, indeed, which is every where essentially the same, has been the scourge of our fleets and armies in every part of the globe ; and, notwithstanding the many opportunities of finding out more successful methods of treatment, has hitherto continued to commit incredible devastation.

In treating of this subject, I shall in the following sections, give an account of the disease, as it appeared in my voyages to India ; offer some observations on particular remedies ; lay down the common method of treatment which was then pursued ; and lastly point out the manner of giving mercury in obstinate dysenteries, a practice which has been followed in this place, for some years past, with singular success.

SECT. I.

DESCRIPTION OF THE DYSENTERY.

THE dysentery, during the first days, frequently resembles a simple purging ; but, as soon as the mucus is washed off the bowels, the gripes and tenesmus become violent, and the pulse is accelerated : the stools are small, slimy, and often bloody. The disease unless its progress be prevented by proper treatment, grows daily worse, till it either prove fatal, or become chronic.

In unhealthy situations, when epidemic fevers rage, the dysentery is very dangerous. It begins with great rapidity ; and rather seems to be a symptom of the fever than an original disease. This kind of flux has been justly considered by Sydenham, and the most eminent medical writers after him, as the same disease affecting the intestines. But as it greatly alters the type of the prevailing fever ; and differs, in some respects, with regard to the cure, I shall give the description and treatment of the putrid dysentery which happened at Bengal, during the sickly season, in 1768.

The disease for the most part, began with lassitude, slight rigors, disorder at stomach, and bilious vomiting. At first, it exactly resembled the fever, but the paroxysm did not run so high ; and the patients were not so apt to rave. In a day or two, and sometimes later, the dysenteric symptoms made their appearance ; and were attended with the greatest prostration of strength and spirits. If there had been any remissions of the fever at first, they now disappeared : the skin continued hot, the pulse was small and quick ; the tongue became very foul ; and the patients were frequently troubled with hiccup.

When the sick applied early for assistance, the fever and gripes were carried off in a few days ; and, in general, the disease was either removed or became chronic. If it happened otherwise, the symptoms were daily aggravated ; the tongue became very black, and the teeth were covered with a tenacious slime. The nausea, hiccup, and gripes, were very severe ; the stools were small, frequent, and exceedingly putrid, accompanied with tenesmus, and sometimes *prociſientia ani*. The frequency of the evacuations soon reduced the patient to the greatest weakness ; and his countenance became inexpressibly ghastly.

As soon as mortification of the bowels took place, the gripes and other painful symptoms suddenly vanished ; but the nausea, hiccup, and vomiting still continued. The pulse became small, quick, and fluttering ; the stools passed off insensibly, and were intolerably offensive. In all the patients, at this period, convulsive twitchings of the tendons, tremors, and delirium were added.

At this stage, several vomited a viscid fluid, which tinged the lincn, and bed-cloths black. Some had pustules on the legs, arms, and breast, filled with ichorous matter, which degenerated into black putrid sores.

At last the pulse failed ; the extremities became cold ; and the patients, after having been for some days almost insensible of their miserable sufferings, generally expired at stool, exceedingly emaciated.

In some, the dysenteric fever at Bengal, through the whole course of the disease, had regular remissions. In others, it was accompanied with a pain in the region of the liver ; a tickling cough ; and a vomiting of viscid slime. The delirium was never constant, the senses and judgment remaining at intervals entire.

The duration of the dysentery was uncertain : at Bengal it frequently carried off the patient in a few days : at China, if neglected, it proved fatal in seven or eight days ; and, in most places, it was seldom protracted beyond the sixteenth day ; except it assumed a chronic form, and then it sometimes proved fatal after six or seven weeks.

The dysentery depends upon the same remote causes as the remittent fever, and, in unhealthy seasons, is generally, at the same time, epidemic, and always contagious. But it may appear at any season, in hot climates, in consequence of perspiration being suddenly checked by night fogs, or rainy weather ; and by imprudently ex-

posing the body, after being much heated, to the chilling effects of land winds.

The causes of death, in the dysentery, are various. But so far as my observations have extended, both in India and in this country, all the fatal terminations, in the early stage, have depended upon mortification taking place in the bowels; except in children where irritation and debility have brought on convulsions. In the advanced stage (depending upon inflammation, ulceration, and a diseased state of the intestines*) sometimes, likewise,

* Dr. Cleghorn upon opening the bodies of patients, who died of the dysentery, at Minorca, constantly found the great intestines either entirely mortified, or partly inflamed, and partly mortified: the rectum was most affected, and, in many, he observed sehirrous tubercles straitening the cavity of the colon in several places.

The morbid appearances in dysenteries have been still more fully described by Mr. Hewson, Dr. Woollaston, and especially Dr. John Hunter in his observations on the diseases of the army in Jamaica. As the dissections of these gentlemen illustrate the causes of death in the dysentery, they should be carefully attended to; and therefore, the reader is referred to the works which contain them. But I cannot refrain from introducing the following quotation, from Dr. Hunter's book, as it contains much information, on this subject, in few words.

“ Upon a first view the bowels, particularly the colon, appear irregularly contracted, and redder than natural at the contracted parts. Upon a nearer inspection, by cutting out portions of the gut and examining the internal coats, the appearances of disease become more evident: There are to be seen small tubercles, like pustules, sometimes in a smaller, sometimes in a greater number; and they are to be found in different stages, so that their progress can only be collected from several observations combined. The same subject will frequently furnish, in different portions of the gut, examples of the several stages. Their progress appears to be nearly as follows; there is first a small round tubercle of a reddish colour, and not more than one tenth of an inch in diameter; it increases gradually till it be near a quarter of an inch in diameter, and becomes paler as it grows larger. In this

mortification, but more frequently an habitual fever with extreme emaciation puts a period to the patient's miseries.

stage there appears a small crack on the top with a slight depression, which gradually increase; and, on examining the contents of the little tumor, I have generally found them to be a cheese-like substance. The pustule, for, though it contain no pus, I do not know any name more expressive of its appearance, is seated under the villous coat, between that and the muscular coat. As the opening enlarges, the edges become prominent, and the base grows rough and scabrous, from which matter oozes out, that is sometimes tinged with blood. Such is the progress of one, but they are often in clusters, and become confluent, so as to form a rough unequal ulcerated surface, with an hard and thickened base. Sometimes they appear like a small eating ulcer in the gut, in which the prominence of the edges gives an appearance of a loss of substance, or as if the villous coat were entirely removed."

The ingenious Dr. Donald Monro has also given a full account of the appearances, he observed on dissecting the bodies of those who died of dysenteries. In all of them he found a number of black gangrenous spots in the colon and rectum, and erosions of the villous coat of those intestines: and he says, that Mr. Glass, an ingenious surgeon, in the service of the East India Company, in the bodies of several people who died of the dysentery, in his two last voyages, found black spots with erosions in the middle in the rectum and colon: and, in two patients, the lower part of the ilium was affected in the same manner.

Sir John Pringle relates the morbid appearance he observed in dissecting a soldier, who had been ill, about twenty-three days, of the dysentery. The large intestines were of a blackish colour, and had a putrid appearance: their coats were remarkably thick, and on the inside ulcerated, especially in the rectum and lower part of the colon, where the villous coat was either abraded, or changed into a corrupted slimy substance of a greenish cast. See *Sir John Pringle on the diseases of the army*, 7th Ed. page 244. *Baker's Opuscula Medica*, iterum edita, page 69, and *Monro's Observations on the means of preserving the health of soldiers*, Vol. I. page 326.

SECT. II.

OBSERVATIONS ON PARTICULAR REMEDIES USED IN THE DYSENTERY.

BLEEDING has been esteemed absolutely necessary in the beginning of most fluxes. When the disease is accompanied with a fever of the inflammatory kind, no evacuation is better calculated for the relief of the patient; or better adapted to restrain the hemorrhage. But, in hot climates, fluxes being either of a chronic nature, or accompanied with a low fever, the strength of the patient sinks from the beginning. When blood appears in the stools, which, however, is not always the case, there are the most evident symptoms of debility, and tendency in the humours to putrefaction. The hemorrhage seems to be owing to a determination of the blood to the intestines, and not to too great a quantity in the general system; and the erysipelatous inflammation of the villous coat of the intestines appears to be occasioned by ærid humors contained in them. To lessen the quantity of blood would only serve to impair the patient's strength; and, if it did not immediately prove fatal, would, at least, precipitate his fate. I do not remember to have met with above a case or two which seemed to require bleeding; and the operation, though performed early in the disease, did not in the least relieve the patient.

EMETICS. The most effectual emetics are either emetic tartar* combined with ipecacuanha, or a few grains of the former dissolved in a decoction of tamarinds. This last form was preferred when the patient was feverish, and it not only proved one of the most powerful eme-

* Antimonium Tartarisatum, Ph. Lond.

tics ; but likewise, by acting as a purge, relieved the troublesome tenesmus. I never above twice tried the cerated glass of antimony, which, in the first case did not operate at all, though given to the quantity of ten grains ; and, in the last, operated very severely. The small quantity of wax contained in this preparation can certainly be of little or no service. Emetic tartar, being the most certain of all antimonials, ought to be preferred.

PURGATIVES are of the greatest consequence in this disease : but at the same time that they ought to evacuate powerfully, they should not stimulate too much. For this reason the neutral purging salts answer best ; and the medicines of this class, to which I have usually trusted, are Glauber,* and the bitter purging salts.† In general, I have found the last operate with more ease than the former. There being a necessity for frequent repetitions of these medicines, they ought to be rendered as palatable as possible ; and every addition which alters their easy purgative qualities should be carefully avoided. Manna, which is very commonly given with these salts, renders them more nauseous ; and, by occasioning fermentation in the bowels, brings on gripes during their operation.

The best correctors of bitter saline purges are crystals of tartar, or lemon-juice, with brandy, which render them more agreeable to every palate. This is undoubtedly a matter of no small importance, where there is an absolute necessity to continue them daily ; besides, in putrid cases, such additions must be conducive to the cure.

Castor oil, when properly prepared, and not grown rancid by keeping, I have found to be one of the best

* Natron Vitriolatum, Ph. Lond.

† Magnesia Vitriolata, Ph. Lond.

purges in the dysentery. It seems to be possessed of an anodyne quality, frequently easing the painful gripes as soon as taken, and seldom fails, when it agrees with the stomach, to procure copious evacuations.

Rhubarb, in large doses, with calomel, for want of other purgatives, has been frequently tried; but, during its operation, the gripes were generally increased, and the troublesome tenesmus seldom or never mitigated. Finding this to be the case, upon exhibiting the first dose, I seldom repeated it a second time to the same person: and observing, that, after some of the patients in the Bengal flux had been in a state of convalescence, a few grains of calomel, given for some urgent venereal symptom, brought on a salivation, and sometimes a return of the former symptoms of the dysentery, I had my fears concerning the propriety of prescribing mercury; which, at that time, I believed to be a powerful septic.

But although rhubarb does not answer in the beginning of the dysentery, yet, in its advanced state, it often produces the best effects. In the Bengal flux, when the patients were in a convalescent state, rhubarb often proved of great service; particularly when five grains of the powder, or a dram of the tincture, was exhibited in a glass of wine before dinner; but in bad cases, a decoction of bark, sometimes with cascarilla, was prescribed at the same time.

IPECACUANHA, in small doses, has been accounted a specific for the cure of the dysentery. The qualities of causing perspiration, relieving the gripes, and opening the bowels, are usually ascribed to it. If it were really possessed of these virtues, it would undoubtedly be an inestimable remedy. I have frequently tried it, but must acknowledge, with very little advantage. A few grains

of it will keep up a troublesome sickness, but I seldom saw it relieve the gripes, or occasion an easy stool. In the beginning of the disease, prescribing it alone is only trifling with the patient.

From the failure of ipecacuanha, so much celebrated as a principal remedy in Europe,* I was induced to believe, that by keeping, in a hot climate, it was totally deprived of its purgative qualities. The authority of Piso, who first recommended it in the dysentery, confirms me in this opinion. He gave an infusion of it when fresh, and chiefly relied upon its virtues as a cathartic.

But I would not seem to infer from this, that ipecacuanha is an useless medicine in the dysentery : when joined with opium, it is one of the best astringents ; and when given with an intention to clear the first passages, its purgative quality can be restored by the addition of a quarter of a grain of emetic tartar to each dose. In this last form I have often given it with good effects ; but when the purgatives already mentioned can be procured, they ought always to be preferred.

ASTRINGENTS. Many medicines, from their power in restraining diarrhœas, have had this title conferred upon them. But a dysentery, consisting in a constipation of the bowels, has no occasion, at least in the beginning, for such remedies. In this disease, indeed, a purging may sometimes continue merely from want of tone in the bowels ; but, as the chronic state, nine times out of ten, depends upon ulceration or obstruction in the coats of the intestines, astringents are commonly useless, and generally very pernicious.

* Ipecacuanha I have since found as little to be depended upon in the dysenteries of this country, as in those of the East Indies.

The compositions most commonly prescribed for restraining profuse evacuations of the bowels, are diascordium; the compound powder of bole, or of chalk, with opium, of the London Dispensatory; or the japonic electuary of the Edinburgh Dispensatory. The three first are gently astringent, but their virtues depend chiefly on the opium and the absorbent powder they contain. The latter is more astringent and is likewise combined with opium. But they are all extremely hurtful in the early state, and seldom afford any lasting advantage, even in the chronic stage of the distemper.

In the advanced state of the disease, when astringents seemed allowable, in my voyages to India, I tried the extract of logwood, and simarouba, but always found them very ineffectual medicines. They both soon spoil in hot climates; and, with respect to the extract, this probably was a fortunate circumstance; otherwise, in the liberal manner I have known it prescribed, it might have produced many serious ill effects. In my practice in this country, I have seldom prescribed any of these astringents in the dysentery, finding the few rare cases, which depend upon mere laxity of the intestines, yield readily to small doses of ippecacuanha and opium; and to the use of colombo in infusion or powder.

PERUVIAN BARK, from its corroborant, astringent, and antiseptic virtues, seems to be well adapted for the cure of this disease, especially when it depends on the same causes which produce remittent fevers. Although it will generally be found to be possessed of virtues far superior to every other astringent, yet it is not near so great a specific in fluxes as in fevers. In the putrid flux at Bengal, however, no medicine was attended with more

wonderful effects*. It was found as necessary a part of the cure as evacuations by vomits and purges. At first, cascarilla was given with advantage; but, the

* In the year 1771, after a tedious voyage to the coast of Malabar, a putrid dysentery made its appearance on board the True Britain Indiaman. The following observations on the cure were communicated to me by Mr Foreman, surgeon of that ship.

“After thoroughly cleansing the primæ viæ, I found it the best way to have immediate recourse to the bark, in as large doses as the stomach would bear, with a grain of opium every four hours. This method of treatment was owing to the following incident.

“January 14th, 1771. At Onoat, I was seized with a cholera morbus, which terminated in the dysentery. A variety of medicines were tried, but in vain. The disease daily increased, my strength was much reduced, and my stools became exceedingly putrid.

“On the 29th, I arrived at Bombay, and, by the advice of the surgeons there, took pills of ipecacuanha and camphor, a medicine in great repute in most parts of India. During the use of these, becoming daily worse, I was determined once more to prescribe for myself, and therefore took, every four hours, two ounces of a strong decoction of bark, with a grain of opium. My drink was port-wine negus, and I eat a pound of grapes in the day. In three or four days, I was so much better, that my stomach could bear a dram of the bark in substance every four hours: but it was still necessary to take opium, to prevent it from running off by stool. As my strength returned, I gradually left off the use of the opium, but continued the bark till I was able to use the cold bath.

“Upon my recovery I was desired to visit Mr. —, who came out in the True Britain, and was seized with the disorder in the middle of January; I found him much exhausted. From the time he landed at Bombay, he had taken nothing but the pills of ipecacuanha and camphor. A dose of salts was prescribed, and the bark and opium in the same way I had used them; by which means the disease was removed in a few days.

“Our joiner, after having been several weeks in the hospital, where he was growing daily worse, left it, and recovered in little more than a week by the use of the bark and opium.

symptoms of putrescency running high, it was thought necessary to combine it with the bark, the latter being of a much more antiseptic nature. They were first given in decoction, and afterwards in substance, as soon as the stomach could digest them. Yet, in several cases, the bowels were so irritable, that, notwithstanding the use of opiates, the medicine was speedily carried off by stool, and the patients, in a manner half corrupted, fell victims to the disease.

Since that period, I have given the bark in the dysentery, in the Straits of Malacca, and at China, in the year 1771, and also in the dysenteries which have occurred in England, without producing any good effects. It seemed on the contrary often to aggravate all the symptoms, and was never attended with the least advantage till the disease was overcome, and nothing seemed to be wanting to complete the cure, except bracing the relaxed intestines.

“ Above thirty dysenteric patients were treated in the same manner, and I was so fortunate as to lose only one, who, after having had the disorder a long time, relapsed in the convalescent state, and died in a few weeks. But it is necessary to remark, that this man had such an aversion to the bark, that, although he had been cured by it once, I could never prevail upon him to take it again in any form whatever. Three others, indeed, died of this disease; but, as I did not attend them, bark and opium were not prescribed.

“ Till lately, I imagined this was a new method of treating the dysentery; but, in looking over Dr. Morton's works, I find bark and opium were given in as large doses by that judicious Physician.”

SECT. III.

OF THE COMMON METHOD OF TREATING THE DYSENTERY.

IN the early stage of the dysentery, in my voyages to the East Indies, I found the following method of cure most effectual. First of all, the emetic powder, No. 18, was prescribed, which seldom failed to operate powerfully, and generally relieved both the stomach and bowels.

Next morning, I gave the prescription, No. 20, or 21 ; and, unless the pain of the bowels and tenesmus abated, one of these purges was repeated for the four following days, in such doses as to keep up a free discharge by stool. During this course, the opiate, No. 23, was taken every night at bed-time. But when the irritation in the rectum was violent, emollient and anodyne glysters gave more relief. For this purpose, I directed six ounces of a decoction of linseed, or starch, with forty or fifty drops of tincture of opium, to be injected.

If the disease continued longer, and it appeared to be necessary to restrain the purging, I gave small doses of ipecacuanha and opium, having recourse to laxatives from time to time, if the gripes returned.

In the Bengal dysentery, the same method was followed, only, when the disease was accompanied with fever, the decoction, No. 19, generally answered better than the emetic powder : and, in most cases, it was found indispensably necessary, both to prevent putrefaction, and to reduce the fever, to use the evacuating method alternately with the decoction of bark, No. 25.

Any other method of cure I always found very inef-

fectual; and, unless the fever or symptoms of putrefaction demanded the intermediate use of other remedies, considerable ground was lost by omitting the purgatives for one day. These continued evacuations may, at first sight, appear hard in a disease attended with symptoms of putrefaction and great prostration of strength; yet certainly every one acquainted with the matter will readily allow, that a continual fruitless straining, and painful tenesmus, will weaken the patient more in twenty-four hours, than three or four easy motions, procured in the same time by a gentle cathartic.

If the dysentery attack with vomiting and irritability of stomach, the same remedies must be applied as directed, for these symptoms, in the remittent fever.* When the griping and pains in the bowels are very severe in the beginning of the disease, fomentations, the warm bath, and a large blister to the abdomen, are of the utmost consequence, not only, to assuage the torment of the patient, but also to obviate inflammation, which, in the worst cases, is very apt to end speedily in gangrene.

The regimen ought to be much the same, as that already recommended in the remittent fever. And, when the disease is accompanied with putrid symptoms, nothing will be found to answer better than ripe fruits. In the dysentery at Bengal, when these could not be procured for the common sailors, I have, with great advantage, added vinegar to the drinks, and never found that this acid increased their gripes.

But when the disease continues long, and the patient begins to recover, both ripe fruits and vegetable acids should be given sparingly, as they are then apt to bring on a return of the disorder.

* See page 128.

The food should consist of smooth farinaceous substances, such as rice-jelly (called in India congee), water-gruel, sago, or salep, to which wine should be added, even freely when necessary, to support the strength of the patient. The most proper drinks are barley-water, thin rice-gruel; and, when the gripes are severe, and demulcents indicated, almond-milk,* or the decoction of starch, No. 26.

Through the whole course of the disease, the air ought to be kept cool and pure, particularly on board of ship, where many patients are often crowded together; for, unless the sick birth be frequently washed, fumigated, and sprinkled with vinegar, it will be in vain to think of removing the disease or to prevent it from becoming general, by the most powerful remedies given internally.

In the convalescent state, the patient should abstain from all animal food, except light soups. But when the bowels have, in some measure, recovered their tone, a moderate use of such flesh meats as are the least stimulating, may be allowed: and, for the patient's greater security, a dose of the infusion of the Peruvian bark, No. 7, or colombo, No. 27, should be taken twice or thrice a day.

When the strength is, in some measure, restored, the use of the cold bath, gentle exercise in a carriage, but particularly a change of climate,† are the most effectual means to confirm the cure.

* Lac Amygdalæ Ph. Lond.

† Convalescents, after a fit of sickness in Bengal, would often be restored to health by a voyage to the coasts of Malabar or Coromandel. Those who continue valetudinary at Madras, often recover their usual health by a short residence at China; or, instead of this, they might go to Bengal during the pleasant and healthy months of December, January, and February. The gentlemen reduced by fluxes

SECT. IV.

OF THE TREATMENT OF OBSTINATE DYSENTERIES BY MERCURY.

SUCH was the method of treatment I pursued in recent dysenteries, in my voyages to India ; which, indeed, only differed from the practice of authors, at that time, in administering gentle purgatives *daily*, till the distemper began to yield. But, when the flux was neglected in the beginning, the recovery of the patient became precarious, and all the medicines I was then acquainted with, afforded little more than mere palliation.

Since that period, I have often found the dysentery, in this country, too obstinate in its nature to yield to such simple treatment, even when called early in the distemper. The insufficiency of the established practice, after the complaint is confirmed, has, indeed, been acknowledged by those most conversant in the disease ;* and,

at China, may take a voyage to St. Helena, or the more delightful settlements of the Dutch at the Cape. Such shifting of climates would save many lives, and may be put in practice when a return to Europe would be very inconvenient.

* Dr. Cleghorn observes, " That almost all the dysenteries which fell under his observation, unless they were speedily cured in the beginning, at best proved obstinate, and too frequently fatal, in spite of the many boasted specifics for this distemper." *Diseases of Minorca*, page 228.

The candid Dr. Donald Monro also observes, " Upon my first being employed in the military hospitals in Germany, I was surprised to see so many of the old dysenteric cases end fatally ; and imagined I had not fallen upon the right method of treating them : but upon consulting the other physical people employed in the same service, I found them as unsuccessful, as myself, after having tried a variety of remedies : and at last, I was convinced, that the disorder will often end

when it is considered, that inflammation and ulceration so often affect the intestines, it is not surprising that the feeble means, hitherto proposed, have, in such cases, so generally proved ineffectual.

For several years past, when the dysentery has resisted the common mode of practice, I have administered mercury with the greatest success ; and am thoroughly persuaded it is possessed of powers to remove inflammation, and ulceration of the intestines, which are the chief causes of death in this distemper.

In the year 1781, the dysentery was introduced into a dock-yard, in this neighbourhood, by some sailors who returned from abroad ill of the complaint. The disease soon spread amongst the workmen, and several died. I was sent to visit a person, who had laboured fourteen days under the disease, and had taken the usual medicines, without ever procuring the least relief, or occasioning one feculent evacuation. In spite of every remedy, he died in a few days. I visited several others, who had been also treated unsuccessfully in the usual manner ; and

fatally, notwithstanding the use of what are esteemed the most efficacious remedies, when once it has continued long, and injured the structure of the intestines to a certain degree ; and that, when this disorder is violent, the cure principally depends upon an early and speedy application of proper remedies, before the strength be exhausted, or the structure of the bowels too much hurt. The bad success we had in treating these old cases, may, perhaps, surprise those who have never practised except in healthful cities, where the disease is commonly mild, and people apply soon for advice. But all those gentlemen who have had the care of military hospitals, where the dysentery has been frequent, and where the sick have often been sent a great way, before they reached the hospitals, must be convinced of the truth of what is here asserted." *Observations on the means of preserving the health of soldiers.* Vol. I. page 336.

prescribed from five to ten grains of calomel, with one or two grains of opium, every night at bed-time, with the occasional use of a saline purgative. In a few days the bowels were opened, and the most threatening symptoms were soon removed. To those in the chronic stage, small doses of calomel, with opium, were given every night; and sometimes in the morning, with a purge at proper intervals; and all whom I attended recovered, except one patient, whose liver was much enlarged, and in a state of suppuration when I first visited him.

In autumn 1783, the dysentery was epidemical in Newcastle and its neighbourhood. I was called to several cases in private practice, which had resisted the common treatment; and attended sixty patients belonging to the Dispensary. Calomel, in almost every instance in which it was exhibited, soon subdued the disease, or reduced it to the nature of a simple diarrhœa.

In the following autumn the dysentery was again prevalent. The same remedy was tried, in obstinate cases, and every patient recovered.

Although, in the above instances of epidemic dysentery, the superior efficacy of calomel seemed to be established, yet I was still in doubt whether to impute its virtues to its purgative, or to its mercurial quality. But in the autumn of the year 1785, the dysentery again made its appearance, and was attended, in many patients, with so great irritability of the stomach, that the common purgatives were immediately rejected. To two patients, in this situation, I gave three grains of calomel, conjoined with opium, every four hours, which in both allayed the vomiting. By an inconsiderable quantity of mercury, the gums became tender: in consequence of which, the gripes and tenesmus were instantly relieved; natural

evacuations followed; and health was speedily restored, without the assistance of any other medicine.

Being now thoroughly convinced of the advantages resulting from calomel as a mercurial, I gave it more freely during the course of the epidemic, and also recommended the practice to all my medical friends, in this neighbourhood. All of them have concurred in observing, that they were much more successful than formerly; and that generally, as soon as the medicine occasioned the slightest tenderness of the gums, the distemper was either speedily removed, or became extremely tractable.

In prescribing mercury, in the dysentery, the physician will be at the same loss with respect to the quantity, which may be requisite to affect the system, as he is in other complaints. In some patients twelve grains of calomel, in divided doses, will bring on slight symptoms of salivation. The majority, however, in this country, will bear from twenty to thirty grains; and, in a few instances, it has been found necessary to persevere in its use, along with purgatives, till one dram or more has been taken.

The dose of calomel, in the early stage of the dysentery, should be always adapted to the violence of the distemper. In the beginning it ought to be given from five to eight or ten grains, with a sufficient quantity of opium to procure an alleviation of the gripes; and, after a few nights, the quantity should be diminished. In the acute stage, a saline purge should be occasionally administered, with a view to carry off acrid corrupted humours; and, if it operate freely, it will generally afford the greatest relief: but, in very obstinate cases, the disease will seldom abate much of its violence, till some degree of

tenderness be perceived in the mouth. At the same time, however, care must be taken not to bring on any considerable degree of salivation, which will always prolong the recovery.

In the acute stage of the disease, I have always preferred calomel to every other preparation of mercury, on account of its laxative properties; and to render it more certainly so, and likewise to determine it to the surface, I at first combined it with a small portion of tartar emetic*. But in my latter practice I have generally added no other medicine to it, except opium.

In the chronic stage of the disease, in which the patient is always considerably debilitated, a salivation ought to be carefully avoided. Calomel should, therefore, be only given, in small doses, as an alterative, conjoined with opium. And if it still, with such an addition, prove too laxative, from two to four grains of crude quicksilver, extinguished with mucilage of gum-arabic, ought to be substituted. In this state of the disease a pill, composed of one grain or two of ipecacuanha, and half a grain of opium, with a sufficient quantity of conserve of roses, should be taken every morning, with the occasional use of rhubarb, demulcents, absorbents, or colombo, as may seem to be indicated.

But, with a view to illustrate this subject more fully, I shall subjoin the following histories, which, it is hoped, will convey some idea of the great obstinacy of the dysentery in particular seasons; and also place the merit of the treatment by mercury in a proper light.

* Antimonium Tartarisatum, Ph. Lond.

CASES OF THE DYSENTERY TREATED WITH MERCURY.

CASE I.

WILLIAM DIXON, aged 37, who had laboured under the dysentery for nine days, was admitted to the Dispensary on the 2d of August, 1785. The gripes were intolerably severe, the evacuations painful, and very frequent; and, for above a week, he had passed nothing except mucus tinged with blood. In the evening the calomel pills, No. 24, were prescribed; and he was ordered to take one immediately, and the other in an hour, drinking with the latter barley-water, or thin gruel to encourage their operation. At bed-time he took an opiate.

August 3d. He vomited once, and had three excrementitious evacuations after the pills began to operate; which mitigated his pain for two hours. But, soon afterwards, his complaints recurred with greater violence; and he had a fruitless motion to stool every hour through the night. An antimonial emetic was prescribed, and five grains of calomel, with two grains of opium at bed-time. He was also ordered to take the purgative, No. 20, on the following morning.

4th. He rested well from ten o'clock last night till four this morning, and had one easy motion before he took the purgative; which also operated five times. The gripes and tenesmus returning in the afternoon, with great violence, the calomel and opium were repeated.

For three nights longer he continued the calomel and opium, and took the saline purgative occasionally; by which means the disease was reduced to a simple diar-

rhœa ; which was soon removed by small doses of ipecacuanha and opium ; and two or three doses of rhubarb.

CASE II.

MARY LAIDLER, aged 23, was admitted to the Dispensary on the 24th of August 1785. She had been afflicted with the dysentery for four days ; and complained of great pain in her bowels, constant griping and tenesmus ; and evacuated nothing but mucus tinged with blood. Her pulse beat 112 ; she was very thirsty ; her head ached ; and she had hot and cold fits alternately. The calomel pills, No. 24, were given as in the former case ; which vomited her twice, and produced two feculent evacuations. At bed-time an anodyne was prescribed ; and in the morning a dose of salts.

August 25th. She vomited the salts in the morning, and continued in great pain through the whole day. Six grains of calomel, with two grains of opium, made into pills with conserve of roses, were ordered at bed-time.

26th. She had a tolerable night, but the gripes and tenesmus returning in the morning, the saline purgative was given, which her stomach retained, and during its operation, gave great relief : but soon afterwards the painful symptoms recurred with their former violence. The calomel pills with opium were repeated at bed-time.

Notwithstanding the frequent repetition of purgatives, her disease did not yield till the first of September, when she had taken half a dram of calomel. Her mouth then became tender ; the gripes and tenesmus left her ; and her stools, which were of a green colour, were evacuated with ease. A gentle salivation continued to the 7th of

September; her evacuations became natural, and she seldom passed more than one stool in the twenty-four hours.

On the 14th of September, after some errors in diet, she had a return of the gripes and tenesmus, which were removed by one dose of calomel and opium. On the following morning she took a dose of salts. An opiate was continued at bed-time, for some nights longer; and, on the 17th, she was dismissed, being perfectly cured.

CASE III.

ELIZABETH LAIDLER, aged 17, the sister of the former patient, was seized with the dysentery on the 23d of August. The symptoms being very violent, the calomel pills, with emetic tartar, were prescribed: and, as her disease was so recent, she took nothing more for some days, than an anodyne at bed-time, and a saline purge occasionally in the morning. Her complaints becoming worse, on the 27th, she was directed to take two pills, with eight grains of calomel, and two grains of opium, at bed-time.

August 28th. The gripes and tenesmus being severe in the morning, the saline purgative was prescribed, which gave two feculent evacuations. But in the afternoon all her complaints were again aggravated, and she passed twelve small slimy stools, some of them variegated with green and yellow, and some tinged with blood. Three grains of calomel, with half a grain of opium, were directed to be taken every four hours, and one scruple of Dover's powder at bed-time.

On the 29th, I did not visit her: but she was better

than formerly, passed three excrementitious stools in the day, and had a good night.

On the 30th, the gripes and pain of her bowels returning with violence, the saline purgative was repeated; and as it only afforded temporary ease, five grains of calomel, with one scruple of Dover's powder, were given, in the form of a bolus, at bed-time.

September 1st. Having taken twenty grains of calomel, since the 28th ult. she, this day, complained of her mouth; but said that her bowels were totally relieved. From this time she had one or two feculent evacuations daily. On the 7th, her mouth was quite well. She had no return of the dysenteric symptoms after her mouth became affected, nor had occasion for any other medicines, except an opiate at nights; and a dose or two of rhubarb. On the 17th of September, her health being established, she was dismissed.

Her brother was also violently attacked with the same distemper, which was removed, in a few days, by taking every night calomel and opium, with the occasional use of laxatives. Her mother likewise was seized with the dysentery, but in a milder form, which soon yielded to the common treatment.

CASE IV.

CHRISTIAN HALL, aged 21, from lying in the same bed with a child who had the dysentery, caught the disease on the 20th of August. On the 22d, the apothecary of the Dispensary prescribed the calomel pills with emetic tartar, and on the following morning the saline purgative.

August 23d. I first visited her. She was feverish, and had received nothing but temporary relief from the above medicines; the gripes, tenesmus, and fruitless attempts for an evacuation being still exceedingly urgent. Eight grains of calomel, with one of opium, were given at bed-time, and the purgative was ordered to be again taken in the morning.

24th. She had four feculent evacuations; but in the afternoon all her complaints returned. A dose of Dover's powder was given at bed-time. And five grains of calomel, and one grain of opium were directed to be formed into four pills, one of which was ordered to be given in the morning, and to be repeated every four hours.

These pills she continued regularly till as many were taken as contained fifteen grains of calomel. Her disease then yielded. Her stools became natural, and she was in a constant uniform perspiration. On the 24th of September, being free from all complaints, she was dismissed.

CASE V.

WALTER LEWANS, aged 50, was seized with the dysentery, which he caught from lying in the same room with his wife, and three children, who were ill of the distemper. On the 26th of August, being the second day of his confinement, I visited him; and as his disease was very violent, he was ordered the calomel pills, with emetic tartar, No. 24; and half a dram of Dover's powder at bed-time.

August 27th. The pills having occasioned no evacuations, the saline purgative was given in the morning, which procured a few stools, and, during its operation,

some abatement of the gripes and tenesmus. But in the evening, when I visited him, he was in great torment from the pain in his bowels, and from a continual desire to go to stool, passing nothing but bloody mucus. Fomentations were directed to be applied frequently to his bowels: and Dover's powder with five grains of calomel, in a bolus, was prescribed at bed-time. Two ounces of Epsom salts, dissolved in a pint of water, were also ordered to be given in the morning, in divided doses.

28th. The gripes and straining were almost constant last night. This day he passed several green slimy stools, with the salts; but without much abatement of the symptoms. An anodyne glyster was exhibited, which was immediately rejected. The bolus was repeated at bed-time.

29th. All the symptoms continued equally severe. He had scarcely a moment's respite from the close-stool, but passed nothing, except ragged mucous filaments, tinged with blood. The fomentations giving no relief, and a hiccup being urgent, a blister was applied to the abdomen. Ten grains of calomel, and two grains of opium were made up into four soft pills, with a little conserve of roses, one of which was directed to be given every four hours.

30th. He was something easier. Having had no feculent stool, eight grains of calomel, with one grain of emetic tartar were ordered at bed-time, and a dose of Epsom salts in the morning.

Sept. 1st. He had three feculent stools; but the gripes, and tenesmus soon recurred with their former violence. Two grains of calomel and a quarter of a grain of opium were prescribed every four hours; with the decoction, No. 26, for common drink.

On the 4th, his mouth became a little affected with the

calomel. The gripes and tenesmus left him, and his stools continued natural for this and the following day. But on the 6th of September the griping and tenesmus, and the bloody mucous stools returned. A dose of salts was given, which procured larger feculent evacuations than formerly.

After this, small doses of ipecacuanha and opium were prescribed, with a purge occasionally ; and Dover's powder at bed-time. Sometimes his evacuations were natural and voided with ease ; sometimes the contrary, and attended with great tenesmus. Purgatives seemed to be attended with no advantage ; and glysters gave no relief to the tenesmus, as they were instantly rejected. His mouth was still a little tender from the mercury ; he took his food better, and the hiccup had disappeared. The pills, with ipecacuanha and opium, were continued : and he was ordered the suet decoction,* with a view to sheathe the intestines.

On the 15th of September he had recruited some strength ; and had got free of all the painful symptoms, except the tenesmus, which was now attended with *prolapsus ani*. His mouth being quite well, five grains of calomel were again given at bed-time, for two or three nights in succession. After this, his complaints were so much mitigated, that glysters could be retained : from a state of great weakness and emaciation, he was gradually restored to health, and was able to return to his work on the 8th of October.

* Take two ounces of fresh suet, and a pint of new milk, set them over a slow fire, and keep stirring them till they boil ; then add a spoonful of starch finely powdered, and let them boil together.

CASE VI.

As the dysentery, in autumn 1785, was, in several instances, complicated with a low remittent fever, the following history is introduced with a view to shew the application of the practice to such cases.

GEORGE HENDERSON, aged 18, was admitted to the Dispensary, on the 30th of August 1785. He had been feverish for eight days, complained of universal pains; thirst; head-ach; slight rigors, and severe gripes and tenesmus, although he passed only two jagged slimy stools daily. He was sick at the stomach, and his pulse beat 120, but feeble. The calomel pills with emetic tartar, No. 24, were prescribed, which vomited him four times, and occasioned six copious bilious stools, with some hardened lumps of feces. A draught with antimonial wine and tincture of opium was given at bed-time.

August 31st. He sweated profusely in the night. His pulse, this morning, was reduced to 100. The tenesmus was removed, but he was still tormented with gripes. Five grains of calomel, with opium, were directed at bed-time, and the saline purgative, No. 20, in the morning.

September 1st. He had nine green feculent evacuations with the purgative: but he still complained of gripes and tenesmus. Appearing weak, three grains of calomel only, with one grain of opium, were prescribed at bed-time, for this and the two following nights.

His stools became feculent; and he only passed four or five daily. On the 4th of September he was seized with rigors: he became afterwards hot, his pulse rose to 120; and he appeared considerably debilitated. Two

ounces of the decoction of the bark were prescribed every two hours, with a few drops of tincture of opium, if it seemed to run off by the bowels; and an anodyne draught was given at bed-time.

5th. He sweated during the whole night. During this day he passed eight bilious offensive stools, but without any tenesmus. The medicines were continued; but at night he was more feverish.

Next day the dysenteric symptoms totally disappeared; and the distemper now assumed the form of a low fever; and was attended with nocturnal exacerbations and delirium. On the 8th of September his bowels were able to bear the bark in substance. He was supported with a cordial regimen, and took an opiate every night at bed-time. His fever was totally subdued by the 15th of the month: and he soon afterwards recovered his usual state of health.

CASE VII.

A LADY of a delicate constitution, aged 25; subject to frequent returns of hæmoptoe, and to a sore throat attended with specks and slight ulceration; on the 2d of September 1785, was attacked with the dysentery; and in the night passed fifteen mucous evacuations, tinged with blood, and attended with severe gripes and tenesmus. A saline purgative and anodyne glyster were directed by her Surgeon. On the evening of the 3d of September, all her complaints were much aggravated, and she had a constant desire to reach. Five grains of calomel, with half a grain of emetic tartar, and one grain of opium, were ordered.

September 4th. She vomited frequently after the pills,

and in the night had twelve bilious evacuations, some of them larger than before ; but, in the morning, she was in great torment in her bowels, and her stomach rejected every thing. Fomentations, and an anodyne glyster were ordered, to give some alleviation to the pain : a large blister was afterwards applied to the abdomen ; and a pill, with one grain of calomel, and a quarter of a grain of opium, and a saline draught in the act of effervescence, were directed to be taken frequently. The vomiting and painful symptoms were removed in the evening, and she afterwards passed a good night.

5th. Being still easy, but having had no feculent evacuations, castor-oil was directed in the morning ; but, from her not persevering long enough in its use, it had no effect. An emollient glyster was ordered to be exhibited, and three grains of calomel at bed-time.

6th. She had a tolerable night. The gripes and tenesmus being urgent, a decoction of tamarinds, with senna and salts, was prescribed, in separate draughts, this morning. The two first evacuations were excrementitious, but she afterwards had other two quite thin, and as black as ink. This alarmed me much, as I never had seen any person recover from the dysentery, who had passed stools of such a colour. Soon afterwards her pulse rose to 120 ; her skin became cold and clammy ; and she was seized with a violent spasmodic pain in the chest. A bladder with hot water was applied to the seat of pain ; an opiate was given ; and the pills with calomel, as prescribed on the 4th, were ordered to be regularly persevered in.

7th. She had a much better night than could have been expected. The gripes and pains returning in the morning, a saline purgative was prescribed. She passed

in the day four feculent stools, two stained with green and yellow ; and two, making about the quantity of a pint, of the same black colour as before. A dose of calomel and opium was given at bed-time.

On the 8th, the gripes and tenesmus being very severe, the calomel and opium were repeated at bed-time : and, on the morning of the 9th, having considerable nausea and tension over the whole abdomen, the purgative was again given in spoonfuls ; which procured several black evacuations ; but the pain continued without abatement till she got her anodyne at bed-time.

For the two following days she appeared much better ; her stools were sometimes natural, sometimes variegated with green and yellow, and sometimes quite black. The infusion of the bark was prescribed ; but she thought it gave no relief, and, therefore, did not use it liberally.

On the 11th, the nausea, sickness, and gripes returned with violence : her stools, however, were feculent, but often black, with a greenish cast. From this time to the 17th, opium and calomel were given regularly at bed-time, with a laxative occasionally. Although she took about half a dram of calomel, her mouth was never affected. The dysenteric symptoms, however, now totally disappeared. But her recovery was protracted, by an attack of her usual sore throat ; and a troublesome suppression of urine, to which she had been also formerly subject.

CASE VIII.

A MARRIED LADY, aged about forty, on the 27th of August 1785, was seized with the dysentery, which resisted many judicious medicines directed by the late Mr. Hawdon. On the 5th of September, I first visited

her. She was then so much reduced, that she could not sit up in bed. She laboured under continual nausea; vomited frequently; and complained of incessant gripes and tenesmus. She had been forced to go to the close-stool above thirty times, during the last twenty-four hours; but passed nothing except mucus tinged with blood. Her pulse beat 120; she complained of great anxiety and restlessness; and her stomach and bowels were very much inflated, and gave her great pain upon the least pressure. Her countenance was pallid; her eyes sunk; and her whole features exhibited the appearance of a person worn out with pain. She also had clammy sweats on her face and neck; slight hiccup; and complained much of pain in her back and loins, attended with frequent solicitations to make urine; which was hot, and never voided except when she went to stool. In this dangerous state, a large blister was ordered to be applied to the umbilical region, after the use of fomentations; and five grains of calomel, with two of opium, were prescribed at bed-time: a decoction of tamarinds, with Rochelle salt*, was ordered to be taken in the morning by spoonfuls till it operated.

Sept. 6. The sickness and vomiting abated as soon as the blister began to operate: and she passed a better night than formerly. In the morning she had five evacuations attended with less gripes; and, after taking the purgative, she had twelve motions, some of them feculent, and some thin and bilious. In the evening her evacuations were again mucous and bloody, attended with severe griping and tenesmus. Three grains of calomel, with two of opium, were prescribed at bed-time.

* Natron Tartarissatum Ph. Lond.

7th. She rested some in the beginning of the night. In the morning her evacuations were slimy, small, and frequent; some tinged with blood, and others with green bile. The calomel and opium were repeated; and the purgative ordered to be taken in the morning.

8th. She was in an universal sweat this morning; and her pulse beat only 100 pulsations in a minute. Her evacuations were feculent and bilious; and the gripes and tenesmus were much relieved. Having now the utmost aversion to medicine, nothing was ordered except calomel and opium at bed-time.

On the 10th, her stools being very frequent and more copious, one grain of ipecacuanha made into a draught with cinnamon-water and cordial confection* was ordered every four hours with a few drops of tincture of opium. Her stools being restrained, five grains of calomel were given at bed-time with fifteen drops of tincture of opium.

From this time to the 13th, she continued the calomel and opium. Her stools were generally excrementitious; but she still had the hiccups, and soreness of the abdomen, upon the least pressure, and continued feverish. The infusion of bark, with tincture of opium, was prescribed. Having taken thirty-nine grains of calomel, an anodyne draught was ordered at bed-time.

For the five following days she took support better, and now, for the first time, entertained hopes of recovery. Her mouth was a little sore; her evacuations were bilious and feculent, and voided with little pain.

On the 19th, her mouth was considerably ulcerated,

* Conf. Aromatica Ph. Lond.

and she was in a gentle salivation. This day she passed twenty feculent stools : as she thought the infusion of the bark increased her purging, the draughts with ipecacuanha, as prescribed on the 10th, were substituted ; which soon moderated the looseness.

From this to the 6th of October, she continued to spit about one pint and a half in the twenty-four hours, when the salivation began to subside. From the time her mouth ulcerated, the painful complaints of the bowels disappeared ; and, towards the end of the salivation, she had only one motion in three days. Having had no solicitation to make urine, and having voided none for a week past, one dram of dulcified spirit of nitre* was given every four hours, in a saline draught, on the 6th of October ; and on the following morning a gentle laxative. Her urine next day began to flow ; the ulceration of the mouth soon disappeared ; and she very rapidly recovered a state of perfect health.

None of the patients to whom I had hitherto prescribed mercury, in the dysentery, having had so much ulceration of the mouth, I was exceedingly alarmed lest a profuse salivation, in so debilitated a subject, should have proved fatal. But my fears were soon removed, as I found she daily gained more strength ; took her nutriment better, and got free from the dysenteric and febrile symptoms.

CASE IX.

MRS. ———, aged 37, of a delicate make, and, for ten years past, subject at times to a profuse hemorrhage

* Sp. Ætheris Nitrosi Ph. Lond.

from the nose, after waiting upon a relation who died of the dysentery, on the second of September 1785, was seized with the same distemper, in a violent manner. Mr. Hawdon had prescribed an emetic; saline and other purgatives, with opiates occasionally, which had only procured some temporary alleviation.

On the 11th of September I first visited her. Notwithstanding the use of an opiate she had passed a bad night; and had been twelve times at the close-stool, but voided nothing except a little jagged mucus tinged with blood. Her pulse was 120; her tongue dry; her skin parched; and she complained of sickness, great pain in her bowels, of tenesmus and dysuria. Half an ounce of crystals of tartar was dissolved in a quart of barley-water, for common drink; and two pills, composed of five grains of calomel and one of emetic tartar were prescribed; the first to be taken at eleven, and the latter at twelve o'clock. In the evening, when I visited her again, she had passed fifteen stools of the colour and consistence of molasses, without gripes or tenesmus, and found herself very much relieved. Six grains of calomel, and two grains of opium were directed at bed-time, and an infusion of tamarinds with Rochelle salt, to be taken by spoonfuls in the morning.

On the 12th, when Mr. Hawdon and I visited her, she had passed two stools as black as ink; and through the day had twenty evacuations of the same colour, variegated with bile. Six grains of calomel with opium were prescribed at bed-time. On the 13th, the purgative was repeated. She vomited a considerable quantity of green bile, and had fourteen stools in the day. The calomel and opium were again ordered. She drank butter-milk, and was allowed ripe fruit.

On the 14th, in the morning, she vomited three times ! as she still continued feverish, with much inflation of the bowels, the purgative was repeated ; which relieved the gripes and tenesmus. In the afternoon, ten grains of Dover's powder were given in a bolus, and fifteen were ordered at bed-time. Two grains of calomel, with half a grain of opium, and a quarter of a grain of emetic tartar, were also prescribed every four hours.

On the 15th and 16th, her complaints were much mitigated ; and her evacuations were bilious, less frequent, and excrementitious. Her pulse, however, still beat 120 ; she was feeble, and had no desire for nutriment. Having taken in all thirty-one grains of calomel, five grains more were prescribed with opium, at bed-time ; and afterwards its use was interdicted. Next morning a purgative was ordered.

For the two following days she had only a diarrhoea ; but soon afterwards she was seized with a profuse hemorrhage from the nose : purple spots made their appearance in various parts of the body ; and blood began to ooze from her gums. Next day she made bloody urine ; and also passed coagulated blood with her stools, which were now of a natural consistence. The hemorrhage exhausted her much ; but being free from the painful complaints of her bowels, she was in better spirits than could have been expected. As her stomach retained every thing, lemon-juice was given freely in panado and gruel with port wine. The bark was injected in the form of a clyster ; and exhibited liberally by the mouth, both in decoction and substance. For two or three days, blood kept oozing from her nose, gums, or uterus ; and the slightest pressure on any part of her body occasioned an *ecchymosis*. But by taking plenty of support, and the

bark freely, with allum-whey, every alarming symptom disappeared in a week ; and she was speedily restored to a better state of health than she had formerly enjoyed.

This is the only case which has occurred in my practice, where a dissolved state of the blood took place in the dysentery during the mercurial course, although I have prescribed the medicine to some hundreds of patients. I therefore cannot impute these alarming symptoms to the effects of calomel, but to a gradual corruption of the humours induced by a debilitating infectious disease. A history of the same nature has already been related* where the patient had not taken a single grain of mercury.

CASE X.

RALPH BAMBOROUGH, aged 34, was seized with symptoms of colic, which terminated in the dysentery, on the 5th of September. On the 9th he was admitted to the Dispensary. His pulse beat 100; the gripes and tenesmus were very severe ; and, for four days past, he had above forty fruitless efforts to stool, every twenty-four hours. Two grains of emetic tartar, dissolved in boiling water, were added to the saline purgative, No. 20, which procured twelve feculent evacuations ; but, his complaints recurring with violence, six grains of calomel and two of opium were given at bed-time.

On the 10th, he had three bilious stools in the morning : he was greatly relieved, and his pulse was reduced to 84. In the afternoon the pain in his bowels became insufferable ; and he was constantly at the close stool ; but

* See page 190.

passed nothing except slime and blood. The calomel and opium were repeated, which gave instant relief.

On the following morning the saline purgative was taken. But as his complaints did not yield, the calomel and opium were continued every night at bed-time, till the 13th of September. His mouth then became slightly affected, and continued tender till the 18th. From this period the gripes and tenesmus totally disappeared. He had sometimes only one natural evacuation, in the twenty-four hours, and never more than three. On the 20th of September, he was free from every complaint except weakness; and, in a few days, returned to his labour.

One of his children, aged one year, took the complaint, with continual vomiting, griping, and tenesmus, and passed nothing but blood: being totally neglected, I found her dying in convulsions on the fourth day of the distemper.

His other child, aged five, was seized also in a violent manner: four grains of calomel with opium were given every night at bed-time, with a purge occasionally; but the disease did not give way till the mouth was slightly affected; and then it became extremely tractable.

His wife was also attacked with the dysentery, which required the use of calomel; and she speedily recovered.

CASE XI.

DOROTHY RUSSEL, aged 23, was admitted to the Dispensary on the 8th of November, 1785. She had been afflicted with the dysentery for eight days; and her disorder had increased so much that she passed above twenty evacuations every hour, attended with severe

pain in her bowels, and tenesmus. Her pulse beat 120 ; she was very thirsty, and much reduced. The antimonial emetic, No. 18, was prescribed. At bed-time she took a bolus with one scruple of Dover's powder, and six grains of calomel.

Nov. 9th. These medicines had afforded much relief ; and she slept till one o'clock in the morning. From that time till eight, she had twenty efforts to stool, and was in great pain in her bowels. Fomentations were directed ; and the saline purgative ; which procured eight large bilious feculent evacuations. In the afternoon all the former symptoms recurred with violence ; her pulse beat 140, and she had continual nausea. Ten grains of Dover's powder, and two grains of calomel, were ordered at four o'clock ; and five grains of calomel, with two of opium at bed-time.

10th. She was tolerably easy in the beginning of the night ; but all her complaints returned after the effect of the opium was over. One grain and a half of calomel were ordered to be taken every four hours. When she was visited at four o'clock in the afternoon, she was still very feverish, much griped, and had passed thirty-two stools during the last twenty hours, which contained nothing except blood and mucus. One scruple of Dover's powder, with four grains of calomel, was ordered at bed-time, and a dose of salts in the morning.

11th. Her pulse beat 140 ; the nausea, gripes, and tenesmus were very severe ; and the salts scarcely afforded temporary relief. Fomentations were ordered to the abdomen ; and afterwards a large blister. An anodyne clyster was administered at four in the afternoon, and the calomel and opium at bed-time.

12th. She was easier in the night. Through the day,

she passed ten stools as black as ink, with less pain than formerly; but her pulse still continued to beat about 140 pulsations in a minute. She was feeble, and had some hiccup. The anodyne clyster was given in the afternoon. She had now taken twenty-nine grains of calomel; but as it had not in the least affected her gums, and as she was now so weak as to be able to take little medicine, I was determined to persevere in the use of mercury, and to support her strength with smooth panado, rice jelly, and wine. Five grains of calomel, with two of opium, were therefore given at bed-time.

13th. She was at stool every five minutes in the night; and was continually harassed with the hiccup, and nausea. Her pulse, in the morning, beat 128. Her bowels were inflated, and sore upon the least pressure; her face was clammy, and her extremities were cold at times. As she was much griped, whilst I remained in her room, I persuaded her to take the salts. In the afternoon her complaints were not relieved. The anodyne clyster was given at four in the afternoon; and the calomel and opium at bed-time.

14th. The symptoms, in the morning, were the same as yesterday. She had fourteen mucous bloody stools in the day. The gripes, in the afternoon, were less severe. Having taken thirty-nine grains of calomel, and her mouth being tender, it was omitted, and the anodyne prescribed at bed-time.

15th. She was easier this day. Passed twelve stools, some of which were feculent. The anodyne clyster was given at four o'clock in the afternoon, and four grains of calomel with opium at bed-time.

16th. Her pulse beat 128, and was stronger; she had eight stools during the last sixteen hours, most of them

feculent, and intimately mixed with green bile. She also was in an universal warm sweat. Her mouth being very little affected, the calomel and opium were repeated at bed-time.

For the six following days, as there still remained considerable tension of the abdomen, and some degree of hiccup, the calomel was continued; sometimes to the quantity of four, and sometimes only three grains at bed-time. On the 22d, having taken, in all, seventy grains of calomel, and her mouth being sore, it was laid aside. Her stools were now commonly feculent, but sometimes mixed with a little mucus, and sometimes tinged with bile. She was generally in a moderate perspiration, and her pulse subsided to 100. Her appetite began to return, and she shewed signs of a slow recovery.

On the 22d, as she complained of a cough, and general rawness in the throat and stomach, the spermaceti emulsion, with some mucilage of gum-arabic, was prescribed. The opiate was continued at bed-time; and one grain of ipecacuanha, and a quarter of a grain of opium, given every four hours in a pill.

On the 27th, her mouth was perfectly well; but she had three or four stools daily, sometimes with slight gripes, till the 22d of December, when the diarrhœa was totally subdued. After this she rapidly recovered her strength; and was dismissed, in perfect health, on the sixth of January.

The preceding cases I have purposely selected from the epidemic of 1785, because the dysentery was, in that season, more obstinate, in general, than it has ever occurred in my practice. I also attended the Dispensary patients

twice and sometimes thrice daily, to note down the symptoms, and the effects of the medicines. Mr. Wilkie, the Apothecary to the Charity, paid also uncommon attention to see the plan of treatment carried punctually into execution; and entered his observations on the letters of admission. Of thirty-one obstinate cases of dysentery admitted under my care, to whom mercury was given, I did not lose a single patient.

But in private practice I was not so successful. For I lost two patients to whom mercury was given. The first, indeed, had a mortification of the bowels, and died three days after I visited her, being the eighth day of the distemper. The other patient I visited on the second day of the dysentery; she punctually complied with every direction; but passed stools as black as ink early in the distemper; and, on the fifteenth day, died of a mortification in the bowels. She took forty grains of calomel, which had no apparent effect on the gums, or general system.

To illustrate the application of this practice, to the chronic stage of the dysentery, I shall here introduce the following case, where the disease was contracted in India: and, from my experience in this country, I am induced to conclude that mercury will seldom fail, except the intestines be deeply ulcerated, or a consuming hectic formed.

CASE XII.

DAVID HOLLIDAY, a seaman, aged 40, in the autumn of 1781, was seized with the dysentery, whilst he served on board the *Magnanime*, off the island of Ceylon. His complaint was tedious, and obstinate; and he remained two months at the naval hospital at Trincomalie before he recovered. On his passage from the Cape of Good Hope, in April 1783, he was again seized with the dy-

sentery, which continued with severity till he arrived in England in the end of May following.

On the 14th of October, 1785, he was admitted to the Newcastle Dispensary. He was then very much emaciated; his complexion was sallow; and considerable fulness was observable in the region of the stomach. From the time he was attacked with the dysentery off the Cape, he said he had never been free from the complaint for one month at a time; and that he seldom of late had been free from it for one day. His evacuations were small, and rarely exceeded six in number, in one day; but were generally attended with very severe gripes, and with much slime and blood. Two grains of calomel and two of opium, were prescribed every night at bed-time; and one grain and a half of ipecacuanha, with one dram of crystals of tartar, every morning in the form of a bolus.

When he had taken sixteen grains of calomel, his mouth became a little tender: and he had only one easy motion daily. The calomel was now only repeated every alternate night.

His mouth getting quite well, and the dysenteric stools recurring, the calomel was again repeated every night; and as his colour and strength appeared better at every visit, it was persevered in till the 13th of November, when he had taken in all thirty grains. The opiate was continued at bed-time, and the decoction of bark was prescribed.

He continued free from every dysenteric complaint for fourteen days; and having almost recovered his usual strength, no farther medicines were thought necessary.

On the 29th of December, having caught cold, he had a slight diarrhœa, which he would have paid no regard to,

had he not been desired to come to the Dispensary on the slightest return of the complaint. An opiate was ordered every night at bed-time, and two grains of ipecacuanha in the morning; which speedily removed the looseness. Several months after this I saw him in perfect health, without having experienced the least relapse.

Although mercury had not been proposed for the cure of the dysentery when I was last in India, yet it appears that, soon afterwards, its efficacy was confirmed in this disease*. But, having had no correspondence with my acquaintances in that part of the world, this circumstance did not come to my knowledge till the year 1787, when *An Essay on the efficacy of mercury in the cure of inflammatory diseases, and the dysentery*, appeared in the London Medical Journal, by the ingenious Dr. James Lind, of Windsor †.

* Dr. Bogue, of Titchfield, who had been at Calcutta in the year 1757, and communicated some ingenious observations which appeared in the first edition of Dr. Lind's *Essay on the diseases of hot climates*, which I regret was not published before I set out upon my first voyage, revisited India in the year 1772, where he had, for three years, the superintendence of the naval hospitals. He remarks, when he was last there, that mercury was more in use than formerly on the coast of Coromandel, and "That in bilious fluxes, when the common remedies failed, it was used with great success, either by unction, or internally; obstruction in some of the viscera being then supposed to be the cause of the disease. Fluxes of long standing were seldom cured without it."—See Dr. Lind's *Essay on hot climates*, 4th edition, published in 1788, page 99.

† "One of the most useful purposes for which mercury has been given is, that of curing dysenterics—a practice which has been lately followed with the greatest success on the Coromandel coast. It was first made known to the different surgeons in the Carnatic by a letter

The dysentery, on the coast of Coromandel, is far less prevalent than in other parts of India ; and, when it

sent to each of them from the late Mr. Paisly, first surgeon of the Presidency of Madras.

The method is as follows :—As soon as the patient begins to complain of symptoms of dysentery, they give him repeatedly small doses of emetic tartar till it operates upwards and downwards, and thoroughly clears the stomach and bowels ; after which they begin to give mercury combined with ipecacuanha in the following form :

B. Argenti vivi scrupulum,

Pulv. gum. arabic. scrupulos duos,

Aq. puræ q. s.

Tere in mortar. inarmor. ad perfect. extinct. globulorum, et adde

Pulv. rad. ipecacuan. drachmam.

Fiat massa dividenda in pilulas lx., quarum capiat unam, tera vel quartâ quâque horâ.

This medicine they use till the urine, which in the beginning is high coloured, becomes pale, which they look upon as a sign of the disease being subdued ; after which a few opiates, and some small doses of rhubarb, mixed with absorbent powders, generally complete the cure.

During the course of the disease, they do not neglect to administer emollient and starch clysters ; and on the Malabar coast, where they had not in 1780 got into the practice of using mercury in the cure of dysenteries, if the patient had much griping, they put a blister upon the belly, which, they were of opinion, likewise prevents inflammation and mortification, the symptoms most to be apprehended in this disorder.

It is probably from mercury preventing inflammation, and consequently mortification, that the above practice is successful. Mr. Wilson, an ingenious surgeon in the service of the Hon. East-India Company told me, when at Pondicherry, that he had seldom lost above two men in a year by dysenteries in the battalion of seapoys to which he was surgeon, since he became acquainted with the practice of using mercury in this complaint : whereas before that he frequently lost in the battalion from twenty to thirty men by dysenteries in a sickly season. ? London Medical Journal, Vol. 8. p. 153.

appears, is often supported by a diseased state of the liver. This no doubt gave the idea of the propriety of exhibiting mercury; and, if I might venture an opinion, the quantity of this mineral, contained in the pills used on that coast, is only calculated for the removal of such symptomatic dysenteries. Those of an acute and speedily dangerous nature, in other parts of India, will require a more active preparation.

Doctor Balfour, who for many years resided in Bengal, has given calomel, in the acute dysentery, in the same manner as recommended in the preceding pages*: and, although our respective theoretical opinions may be very different, yet I am happy that the practice I have proposed in the former † as well as in the present edition of this work, is confirmed by that of so ingenious a Physician.

But, although mercury, it is presumed, will be found of the greatest use in obstinate dysentery in every part of the world, yet there is a case of this distemper, to which the practice is not applicable; I mean when the disease is complicated with the scurvy. And to guard

* Dr. Balfour's practice in the dysentery, after cleansing the stomach and bowels by an infusion of tamarinds, with emetic tartar and manna, is to give eight grains of calomel, with two grains of opium, at bed-time, on the first day of the disorder, and to continue them for four or five nights following, or longer if the nature of the stools should require it: and to repeat the same quantity of calomel and opium, at any time in the course of the disease, when judged requisite. He at the same time gives in the morning a saline purgative, or castor oil, till the disease begin to yield. See his *Treatise on putrid intestinal remitting fevers*, published 1790, page 142 et seq.

† Without any knowledge of each other, and consequently without any communication of sentiments, Dr. Balfour gave the bark as liberally in the remittent fever of Bengal in the year 1769, as I had done the preceding year without regard to intermissions.

he unexperienced Physician from giving mercury to any patient until the *scorbutic diathesis* be removed, I must recal to his memory what happened to the imperial army in Hungary. “Four hundred of the troops who were afflicted with the scurvy near Belgrade,” says the experienced Kramer, “having taken mercury without my advice, the dreadful consequence was, they all died in a salivation* !”

* See Kramer’s *dissertatio epistolica de scorbuto* 1737: or the analysis given of it by Dr. Lind in his treatise on the scurvy.

CHAP. IV.

OF THE SUCCESS OF THE PRACTICE IN THE REMITTENT FEVER AND
DYSENTERY.

To narrate cases so far only as they may serve to illustrate any proposed method of treatment, will tend very little to improve the science of medicine. This alone can be effected by relating, with candour and fidelity, the unfortunate as well as the favourable events. I shall, therefore, proceed to give a short detail of the success, which attended the practice in the remittent fever and dysentery, during my two voyages to India.

In the collection of cases on the remittent fever, I have inserted all those which terminated fatally.

When the second case* occurred, although I had given the Peruvian bark to several patients, when no remissions of fever could be procured, yet, at that time, I had not sufficiently experienced its safety in continued fevers unaccompanied with symptoms of putrefaction. Every other method was tried, and the case proved unsuccessful. In the two other cases, No. III and XII†, the patients had such an aversion to the bark, that they could not be brought to use it. From all these cases it appears how little dependence can be put upon any other method of treatment.

The case, No. XVI‡, points out the dangerous consequence of neglecting proper evacuations in the beginning of fevers, in unhealthy situations; and, at the same time, shews how necessary they are to prepare the patient for the cure by Peruvian bark.

Before the case, No. XVII, occurred, from the great

* Page 134.

† Page 137 and 154.

‡ Page 161.

success of the practice, I was almost led to believe that the bark, when timely exhibited, was a certain remedy in the cure of fevers in hot climates. Although a few unfortunate events can never detract from the general success of any treatment, yet, they ought to repress human pride, and oblige us to acknowledge the inefficacy which too frequently attends medicine in almost every disease.

As it has been my endeavour merely to represent facts, I shall draw no farther conclusion from the cases; but must add that I have given the bark to one hundred and fifty patients in fevers, at Bengal and other places in the East Indies; and, of that number, lost only one who took the medicine with perseverance.

Amongst a number of patients, afflicted with the Bengal dysentery, I lost four. Two of them were much reduced by preceding fevers before I visited them. Another, having the greatest aversion to every purgative, was prescribed small doses of ipecacuanha. The bark and every other medicine, which had been then recommended, was tried, but all to no purpose; and he died on the forty-second day of the disease.

In my second voyage I attended fifty-eight persons in the dysentery on board the Talbot; and in other ships at China. They all recovered by the method of treatment already laid down in the chapter on the dysentery: but, it is proper to observe, that I had the management of the patients from the very beginning, and of course had time to make the necessary evacuations before their strength was reduced.

I shall conclude with giving an account of the mortality, which happened in all the ships which were stationed at Bengal in 1768, with a view to shew the comparative success of different management.

The Surgeons, who belonged to the ships, used bleeding in the beginning of all fevers, and never prescribed the bark except in distinct remissions. The small quantity, indeed, carried out from England, put it out of their power to give it freely.

One of the ships sailed from England in January, 1762, and arrived at Culpee the 24th of June. Although she left Bengal in the beginning of September, during the rage of sickness; of the ship's company, which consisted of one hundred and nine men, eight died at Bengal, and three during the voyage.

Another ship, with one hundred and thirteen men, although the sickness was not prevalent on board, lost seven in August and September; and during the voyage seven more died:

Another ship, with one hundred and eight men, lost ten during the sickly season at Bengal, and four in the voyage.

The Salisbury, with one hundred and three men, from anchoring at a little distance, and the commanding officer allowing no intercourse with other sickly ships, remained remarkably healthy. Two of her men only died at Culpee, and two more during the voyage.

Another ship, with one hundred and seventeen men, lost thirteen at Bengal, and four during the voyage.

The Ankerwyche lay at Calcutta, and only one man died. Next year she was anchored at Culpee: the ship's company consisted of one hundred and one men; although she sailed on the 17th of October, thirteen died at Bengal; and eight during the voyage.

Of all the ships which were at Culpee, the Dutton and Talbot agreed in most circumstances. They remained there during the sickly season; and were equally visited

by diseases: they were much about the same time out at sea; and were off the Cape of Good Hope in the same stormy weather. The crew of the Dutton consisted of one hundred and seventeen men: sixteen died at Culpee, and twenty-four during the voyage. The Talbot had on board one hundred and eight men: eight died whilst she remained at Culpee, and three in the voyage.

In justice to the method of treatment, which has been proposed, I must observe, that, of the number belonging to the Talbot, one died of a diseased liver, and other two of the dysentery at the hospital in Calcutta. They were sent there by the surgeon who attended in my absence. His practice was never to give the bark, except in perfect intermissions of fever; and to use astringents early in the dysentery. The three who died at sea, fell victims to abscesses in the liver, the consequences of neglected fever or dysentery.

Of eight hundred and seventy-six, the complement of men belonging to eight ships, seventy-eight died at Bengal, and fifty-five at sea; or nearly *one in six*; a mortality, which, it is apprehended, could never have happened, had the bark been given early and liberally in fevers; and had the dysentery been properly treated.

CHAP. V.

OF THE CHOLERA AND DIARRHŒA.

THE CHOLERA is more prevalent on the coasts of Malabar and Coromandel, than in any other part of India, on account of the excessive heat occasioning great secretions of bile, and the chilling effects of the land-winds checking the perspiration, and determining the humours to the bowels.

This disease, although always violent, if proper medical assistance be given in time, seldom terminates fatally. The bilious, or other acrid matters in the stomach and bowels should be instantly diluted and carried off by large draughts of camomile tea; and clysters of tepid water. If the vomiting still continue, the patient should drink infusions of oatmeal, or powdered biscuit, toasted brown.

But the chief dependence after the above mode of dilution, is to be placed on opium. A clyster, therefore, of eighty, a hundred, or a hundred and twenty drops of the tincture of opium, mixed in four ounces of warm water, and a little mucilage of gum-arabic, should be immediately injected; and, soon afterwards, a cordial draught, not exceeding one spoonful in measure, with twenty-five drops of the same tincture, should be exhibited. And these medicines ought to be repeated occasionally, till the vomiting, purging, and cramps disappear; supporting the patient, at the same time, with warm wine and water, if the extremities become cold, or the pulse obscure.

When the cramps are severe, nothing affords more speedy relief than the warm bath. But till this can be

procured, flannels, wrung out of hot water, should be applied to the bowels, and to the extremities ; which afterwards should be rubbed dry, and covered with hot flannel.

After the disease is subdued, nothing farther, by way of medicine, will be required, except, next day, a dose of rhubarb ; and afterwards the infusion of colombo or bark, to strengthen the bowels, if they do not speedily recover their tone.

THE DIARRHŒA, which occurs, at the different harbours in India, amongst the companies of ships newly arrived, seems chiefly to depend upon a sudden change of diet. It is, however, very tractable, requiring only moderation in the use of vegetables, and fresh meat ; a dose or two of rhubarb ; and an opiate at bed-time. If these precautions be neglected at Bengal, in the rainy season, a simple looseness is apt to degenerate into the dysentery.

CHAP. VI.

OBSERVATIONS ON THE COLIC.

THE COLIC which most frequently occurred, during my two voyages to India, either resembled that variety described by Sydenham, under the title of *bilious colic*; or that treated by various authors, under the names of *colica pictonum*, *dry belly-ach*, and *nervous colic*.

The common remote cause of the colic, as it appeared at Madras*, seemed to be owing to the sudden refrigeration of the body whilst overheated. But, as some of the worst cases occurred in persons who were employed in removing pigs of lead from the hold, I was, at first, suspicious that the symptoms were aggravated by the admission of some particles of this metal into the body. However, upon stricter observation and inquiries, it was found that those only, who had imprudently cooled themselves when overheated, were liable to the violent spasmodic muscular pains which sometimes attended or succeeded the attack of the bowels.

The principal indications of cure are, to allay the reaching and vomiting; to appease the pain; and to open the bowels.

In the colic at Madras, when the patient was afflicted with much reaching and no great degree of vomiting, the saline purgative, No. 5, to which one or two grains of emetic tartar were added, was sometimes given, in the beginning by spoonfuls, which both relieved the stomach and bowels.

* See Part I, page 28.

But, when there is much irritability of the stomach, emetics ought not to be exhibited in any form: for the only difficulty in effecting a cure is owing to the vomiting, which is with great difficulty restrained in colics of every kind. The safest plan, therefore, is to unload the rectum by a purgative clyster; and, when there is much sickness, to administer, afterwards, opium in another small clyster, as ordered in the cholera*. When by this method the stomach is, in some degree, quieted, the lenient purgative, No. 5, or No. 6, or castor oil is to be given by spoonfuls till the bowels be sufficiently opened.

In very obstinate colics, purgative medicines, in a liquid form, are rejected as soon as taken; in this case the greatest advantage often results from giving calomel and opium, a practice which I have followed for eighteen years past. My usual dose consists of ten grains of calomel, and two of opium, made up into three small soft pills, with conserve of roses. One of these ought to be given every half hour, or oftener, till the sickness and pain abate. And soon afterwards one of the purgatives, already mentioned, should be administered, by spoonfuls, till a thorough passage be procured.

In exhibiting calomel, in this manner, it once happened, in my practice, in a case of dry belly-ach from lead†, that a moderate salivation was induced. The

* See page 266.

† I am informed by Messrs. Leightons who attend an extensive White-Lead Factory in this neighbourhood, that they have given calomel and opium to the workers, when afflicted with the colic, with the greatest success; together with the occasional use of purgatives. In mild cases a dose or two of calomel they find sufficient: but, in those which are obstinate, they continue the medicine, till the disease goes away, or till the system be, in some degree, saturated. This last

painful symptoms immediately vanished, and the bowels afterwards were easily moved. Sometimes I add to the calomel and opium half a dram of the cathartic extract, and divide the mass into twelve pills, of which two are the common dose, to be repeated every quarter of an hour.

During the above course, fomentations, and the warm bath, should be frequently used, in the manner directed in the former chapter*, and, in obstinate cases, a large blister applied to the abdomen.

I shall conclude these observations by introducing one of the worst cases of colic attended with spasms of the muscles, which occurred, whilst the Talbot lay off Madras.

MR. A—, fifth mate, superintended the men who were employed in the hold in removing the lead, and assisted them in putting it into the sling to be hoisted up by the tackle. By this he was excessively heated, and when he came upon deck for air, he not only drank heartily of weak grog, but also very injudiciously cooled his body, by exposing it, in his shirt, to the land-breeze; when the thermometer was very high†.

On the 12th of August, in the afternoon, he was seized with shivering, sickness, and vomiting. My assistant

effect often takes place with all intermediate doses of calomel, from twelve grains to half a dram; but they observe, except in one case, the colic and painful symptoms were instantly removed, as soon as the tenderness of the gums appeared.

These gentlemen never observed any palsy to succeed the colic. It is probable, that, in the cyder counties, and in the West Indies, where the dry belly-ach is endemic, mercury would be equally successful.

* See page 266.

† See Meteorological Register, page 50.

gave him small doses of emetic tartar, which evacuated much bile. He passed a very restless night, being tormented with violent pains in his bowels, and cramps in his legs.

Aug. 13. This morning, when I first visited him, he was in great agony from stricture and pain about the navel, spasmodic twitches of the arms, and violent cramps in the upper and lower extremities. He faltered in his speech, and had totally lost the use of his legs. His skin was exceedingly hot, his tongue foul, and he had been costive for three days. Two grains of opium were immediately exhibited in a soft pill: fomentations were assiduously applied to the abdomen and extremities; and the saline purgative, No. 5, with the addition of one grain and a half of tartar emetic, was ordered to be taken by spoonfuls. The first and second doses vomited him, and the remainder procured several stools, which were large and bilious. In the evening, his skin was cool and his pulse natural: he could use his limbs, and was free from cramps and convulsions; but complained of the greatest debility and soreness in the calves of his legs. A grain and a half of opium were given at bed-time; after which he passed an easy night, and sweated plentifully.

14th. In the morning his tongue still continued foul, and he complained of pain and stricture about the navel. A full dose of castor oil was ordered. At ten o'clock he was seized with violent cramps in his legs, and convulsive twitchings of his right arm. The laxative having operated three times, a pill with a grain and a half of opium, was given, which procured him immediate relief. The spasms and cramps returning, it was repeated at bed-time.

15th. In the morning the cramps and convulsive

twitchings recurred with violence ; his skin was hot and dry, his pulse small, and only beat 70 pulsations in a minute : his tongue was clean, and his bowels open. A bolus, with fifteen grains of musk and one grain of opium, was prescribed every four hours, with two spoonfuls of a volatile julep.

He continued free from pain in the day ; but, having omitted taking his medicines regularly, he had a very severe attack of the spasms at night, which were again removed by the musk and opium.

On the morning of the 16th, he was free from every complaint, except weakness in his limbs and pains in his bones. His medicines were repeated every four hours, which sweated him profusely : and, at night, he found himself perfectly easy.

On the 17th, being costive, a gentle laxative was prescribed. His complaints totally left him, and he recovered in a few days.

CHAP. VII.

OBSERVATIONS ON THE HEPATITIS, OR DISEASE OF THE LIVER.

IN hot climates, of all the *viscera* in the human body, the liver is most subject to disease. It suffers from obstruction, inflammation, and suppuration.

The disease of the liver is very common over all India, but particularly on the coast of Coromandel. It sometimes attacks in perfect health; and sometimes is the consequence of preceding sickness; and therefore it may, with great propriety, be divided into original and symptomatic.

When the disease is original, it is generally accompanied with an uneasy sensation of weight under the right hypochondrium, and, for the most part, with a very sharp pain about the clavicle or shoulder of the same side. As the disorder increases, the countenance becomes yellow; the patient complains of sickness or oppression at the stomach; difficult respiration; and generally uneasiness when he lies on the opposite side*.

* Sometimes the patient can lie only upon the left side; and this will commonly be the case when the convex part of the liver is affected.

On the 27th of June 1789, I visited a Pitman, who had laboured under symptoms of active inflammation of the liver for near a month. He had been bled and blistered before I saw him. There was an evident swelling of the region of the liver, which was painful upon pressure, and attended with uneasiness of the right clavicle. His pulse beat 120: he was much reduced, and had symptoms of the suppurative stage. Mercury was given in the form of the mixture, No. 28, and the ointment was also rubbed into the part affected. He could never lie upon his right side till the 28th of August, when he complained of a cough, and had certain symptoms of an abscess having burst,

Although these are the common characteristic symptoms of the hepatitis, yet, so insensible is the liver, that suppurations have been found, on dissection, when there have been no reasons to suspect any morbid affection of this organ. It therefore frequently happens, that the disease is fixed, and often incurable, before any alarming symptoms have appeared. The yellow colour, which generally accompanies the disease, is also precarious, as no cause, which does not obstruct the passage of the bile into the *duodenum*, occasions a jaundice: however, in

through the diaphragm, into the cavity of the lungs. The mercurial course, though it was carried so far as to produce slight salivation, had no effect upon his complaint. His suffering daily increased, and at last became insupportable; except when he took very large doses of opium.

Although there was great prominency of the false ribs; and the subcutaneous veins were very turgid, yet the abscess did not point outwards, and he was unwilling to run the risk of an incision to give vent to the matter externally.

His countenance, from the beginning, was sallow; and at last he had a slight jaundice. On the 28th of August, he, for the first time, complained of a cough. He was now in so much pain, and had so great a difficulty of breathing, that he consented to the operation. On the 29th an incision was made by Mr. Anderson, in the presence of Dr. Young, and the two Messrs. Leighton, betwixt the 7th and 8th ribs, at about five inches from the cartilages. Five pints of purulent matter followed; but, at the same time, he was observed to cough up matter from the lungs.

For nine days following, he expectorated near a pint of purulent matter daily; but none flowed from the incision.

On the 9th of September, six pints of purulent matter were discharged from the incision, which relieved his respiration.

The cough and hectic fever, however, increased; and he died, exceedingly emaciated, on the 29th of September. Such cases frequently occur in India, and their fatality can only be prevented, with any degree of probability, by an early exhibition of mercury.

all the cases which have fallen under my care, the countenance became remarkably sallow; and sometimes had a tinge nearly resembling a lead colour.

The disease of the liver has the greatest tendency to imposthumation. When the abscess points outwards, and the matter is discharged by incision, the patient has some chance of recovery; but when it bursts within the cavity of the abdomen, or into that of the thorax, the case will almost always prove fatal*.

* Even in such deplorable determinations of abscess in the liver, the patients must not be relinquished. For, when the strength and spirits are supported, nature has wonderful resources; and, sometimes, such dangerous cases terminate favourably. In support of this assertion, I shall here introduce the following cases.

THE SHIP'S STEWARD, after recovering from the dysentery at Calcutta, was seized with obstruction of the liver. Mercury was given in small doses; but was soon laid aside as he became hectic. In about six weeks after, he passed purulent matter with his stools. He gradually recovered his health, and every symptom of the diseased state of the liver disappeared.

As the matter was only voided in small quantity, it is probable that the abscess was situated favourably for emptying itself by the *ductus communis*.

THE MASTER AND OWNER of a vessel, who had, for about two years, laboured under symptoms of a diseased liver, fell into a confirmed jaundice, which resisted every medicine, that had been prescribed.

On the 27th of September, 1783, I was first desired to attend him. In his passage, from London to Sunderland, he was seized with a violent shivering fit, succeeded by pain in the region of the liver; and he became feverish. When he came ashore, Mr. Barnes bled him, and prescribed some other medicines. I found him still feverish; his pulse beat 120, but was rather feeble. His countenance and whole body were yellow; his urine very high coloured; and his stools white. He was confined to his bed, and could only lie on his back, reclining towards the right side. He had a short cough; a pain in the right shoulder; and a severe stitch in the right hypochondrium when-

Long before I visited India, however repugnant to the theory of inflammation, and the operation of mercury entertained in the schools of Europe, its superior efficacy in hepatitis was established in that quarter of the globe. The medical gentlemen there, finding the common anti-

ever he coughed, or made a large inspiration. Upon examining the situation of the liver, I found its edge hard, and projecting beyond the false ribs; and the least pressure gave him much uneasiness. He was ordered to be bled; a blister was applied to the part, and calomel and opium, together with the saline draughts, were prescribed.

These medicines only gave temporary relief: the suppuration advanced, and he began to cough up purulent matter in great abundance, mixed with bile; in the course of twenty-four hours, sometimes exceeding three pints.

On the 25th of October, when I visited him for the third time, he still expectorated great quantities of matter, had vomited above a pint of pure bile; and passed many bilious stools. What he coughed up, he was sensible ascended from the seat of the liver; but it required great force to be expectorated, and often excited vomiting. His countenance and skin now began to lose the yellow tinge: but he was exceedingly reduced.

On the 13th of November, I again was desired to visit him. The hectic fever had abated; but, being much emaciated, I still had little hopes of his recovery.

His liver still feeling hard, small doses of calomel, with opium; and the strong mercurial ointment, which Mr. Barnes had hitherto managed in a most cautious and judicious manner, were advised to be continued, as an alterative. He was also supported with milk, and cooling nutriment: and every thing was done to support hopes of recovery. His spirits indeed, from the beginning, were wonderfully good.

During the whole suppurative stage, the tone of the bowels was kept up by infusions of colombo and bark; and rest procured at night by opiates.

From the greatest state of emaciation, he gradually recovered; and still (October 1791) enjoys perfect health. His colour is good; his flesh plump; but, according to his own expression, he feels every thing sticking to his right side.

phlogistic treatment ineffectual, and the disorder, under it, proving generally fatal, boldly prescribed mercury. The success exceeded their most sanguine expectations; and it was extolled as almost a never-failing specific. They applied it externally by inunction upon the part; and, at the same time, exhibited calomel internally, in such doses as to excite a salivation. When it produces this effect, before matter be formed, it will be found the most certain and expeditious cure. But I had no doubt that the success of mercury was, at that time, greatly overrated: for it was often prescribed in slight affections of the liver, which, in all probability, might have yielded to bleeding; the repetition of gentle purgatives; and the application of a blister.

Whilst in India, I had an opportunity of seeing the disease, when original, only in six patients. One patient's case was remarkable for a tickling cough, difficult respiration, and irregular exacerbations of fever. On the sixth day, his countenance grew very yellow; he had frequent sickness at the stomach, with a reaching to vomit, and pain about the right clavicle, particularly when the seat of the liver was pressed. He was bled; had a blister applied; and took several doses of* soluble tartar and manna. On the eighth day, his fever abated; the painful symptoms left him; but his countenance remained sallow; and he was exceedingly emaciated. The infusion of chamomile, with salt of tartar, No. 17, was prescribed every three hours. He continued open in the bowels; made his urine copiously; and soon recovered.

The other cases resisting the common treatment, on the

* Kali Tartarizatum, Ph. Lond.

fourth or fifth day of the disease, two grains of calomel, made into a bolus with conserve of roses, were prescribed twice a day, with an opiate in the night-dose, to prevent its running off by stool. As soon as the mouth became affected, the medicine was omitted; and although a salivation was not excited, yet, in all of them, the cure was completed in a fortnight or three weeks. During this course, if the respiration became difficult or the pain in the side more violent, it was necessary to bleed; and to apply a blister to the part affected.

In the preceding cases I preferred the internal use of mercury, on account of the prejudice which seamen have to the ointment, from their idea of it being only necessary in a certain distemper. But in all obstinate and dangerous affections of the liver, in the East Indies, greater dependence is placed in inunction, as the system, in this way, is more fully saturated, before the mercury runs to the salivary glands, or bowels. At the same time a profuse salivation should be avoided, as few evacuations are more debilitating in a hot climate.

To convey some idea of the disease of the liver, when it is the consequence of the remittent fever, or dysentery, I shall subjoin the following histories.

I. Mr. C——; who came out in the *Talbot*, and had been very intemperate during the whole voyage, was seized with the remittent fever, at Calcutta, in the beginning of September 1788.

On the 8th of October I was desired to visit him. He was now exceedingly emaciated. His pulse was frequent; his countenance sallow; and he, for some days past, had a slight hemorrhage from the nose. But what gave him the greatest uneasiness, for several days past, was a weight in the region of the liver, and a sharp pain

about the right clavicle. In these circumstances a German Surgeon had prescribed mercurials, and a decoction of sarsaparilla: judging these to be, at this period of the disease, improper, they were laid aside. A blister was applied to the part affected, and a gentle laxative prescribed.

On the 10th, the pain of the clavicle was removed; the blister had discharged well; but the exacerbations of fever returned at night, with an increase of the pain under the right hypochondrium. As he had taken no bark during the course of his fever; and as the hemorrhage from the nose increased, it was prescribed in strong decoction with the saline draughts.

From this to the 18th, the symptoms were rather flattering, the hectic fever abated, and he was able to sit up. The uneasy sensation continued in his side, although no prominence could be observed; but his weak habit of body deterred Mr. Hamilton, Surgeon at Calcutta, who was then called in, from giving him mercury.

On the 19th, he was seized with a tickling cough; had very difficult respiration; and he could not bear the region of the liver to be pressed. At night, after an attack of rigors, he vomited up a considerable quantity of white fetid matter: the cough and expectoration continued; his countenance became exceedingly ghastly; he gradually sunk; and in three or four days died.

The body was not suffered to be opened; but there is no reason to doubt but that the suppuration of the liver terminated as in the following case.

II. JOSEPH PATINGTON, a man of a strong robust constitution, in the beginning of October, 1768, was seized with the dysentery at Culpce. Having an aversion to medicines, and trusting to his former good health,

he not only neglected every proper precaution ; but lived very irregularly.

In the end of November following, the dysentery left him ; and he was seized with an intermittent fever. Having also neglected this disease, it changed its type, became continual, and was accompanied with symptoms of putrefaction. Bark was now taken, but the fever was never totally subdued.

On the 10th of February, 1769, he complained of a very acute pain in the top of the right shoulder. On examining the region of the liver, no external fulness could be perceived ; but, on pressure, he was sensible of a dull heavy pain in the part. He was much exhausted ; his countenance was yellow ; his pulse was always frequent ; and his fever increased at night. A blister was applied to his side ; and the pain in his shoulder disappeared.

On the 11th, the pain of the clavicle returned, and the feverish paroxysm increased at night. A decoction of bark, with a little soluble tartar, was prescribed. The symptoms remaining the same, and the weak state of his body forbidding the trial of mercury, pills with soap and rhubarb were ordered.

For the following ten days, he seemed to be greatly relieved : the pain in the shoulder left him, and the dull sensation under the right hypochondrium gave him little uneasiness. The pills were continued, with a less quantity of rhubarb, as they had operated too much.

In the beginning of March, his countenance was very yellow. The pain in the seat of the liver became very severe, and was accompanied with oppression at the stomach, and difficult respiration. These symptoms increasing, on the 21st he expectorated near a pint of sanious matter.

On the 28th, a purging was added, and he complained much of sourness in his stomach. Large doses of the testaceous powder were given, but to no purpose, and he died on the 3d of April.

Upon dissection, the liver appeared sound on its surface; but the right lobe extended higher up than usual, and adhered strongly to the diaphragm. At this part, an abscess was found, which contained a considerable quantity of purulent matter. Its shape nearly resembled that of the human heart, and the matter made its way through the diaphragm at the adhesion, which easily admitted the finger. The gall-bladder was full of bile; the spleen was a little enlarged, and the stomach was small and empty.

Upon inspecting the cavity of the thorax, the right lung was wasted and adhered to the diaphragm, and the purulent cavity from the liver ran up several inches into the substance of that lung. No other remarkable morbid appearance was observed.

III. ANOTHER PATIENT, who suffered much from the fever and dysentery in 1768, relapsed into the disease of the liver, to which he had been formerly subject. Mercury was prescribed. The disease, however, terminated in suppuration; and he died in a month after he began the mercurial course.

IV. ON the 20th of June, 1771, I was desired to visit a German belonging to a country ship, lying at the island of Johanna. The vessel had been trading at Delagoa three months before, when a fever of a bad kind raged there, and proved fatal to numbers. All the Europeans that now remained were the captain, and chief mate just recovering from weakness occasioned by the fever; and

the second officer, who had suffered much by the same disease, in the following miserable state.

He was confined to his bed ; all the abdomen was much swelled, particularly under the right hypochondrium ; but he said that part had subsided much during the last fortnight.

A Surgeon, belonging to one of our East-Indiamen, about three weeks before I saw the patient, had prescribed for him : he had taken small doses of calomel, and had a mercurial plaster applied to his side. When the plaster was removed, the integuments over the sixth, seventh, and eighth ribs, were swelled, œdematous, and painful to the touch. When he was turned to the opposite side, he complained of suffocation ; and a quashing of matter in the thorax could be distinctly heard. He constantly laboured under difficult respiration ; and continually coughed, and expectorated a frothy purulent matter to the quantity of two quarts in the twenty-four hours.

In this way he had passed the last fortnight : from a strong healthy man, he was reduced to a mere skeleton, and all his hopes were an ardent wish for death to put a period to his complicated distress.

It was proposed, in order to give him some relief, to make a puncture between the ribs ; but, as we were to sail next day, he would not consent to so precarious an operation.

I was informed by a medical gentleman, who visited this patient a few days after I left him, that a mortification had begun between the sixth and seventh ribs, and that his whole side was emphysematous, with several livid spots. At that time, he still continued expectorating

purulent matter in great abundance, and had every symptom of approaching death.

From the preceding cases it evidently appears, that the remittent fever and dysentery, when allowed to run out for any length of time, frequently terminate in abscess of the liver; and hence we may see the necessity of subduing those diseases speedily, in order to prevent this dangerous consequence.

Before I conclude this chapter, it must be observed that I have found mercury equally successful in inflammation*, and infarction of the liver in this country; and also in several cases of jaundice, which had proved rebellious to the common modes of treatment.

* Edinburgh Medical Commentaries, Vol. V. p. 423,

CHAP. VIII.

OBSERVATIONS ON THE SCURVY.

THAT morbid state of the body, denominated scurvy, seems to depend upon a coincidence of various causes. A salt diet, affording little nutriment, on which seamen are obliged to live, very commonly gives rise to the scorbutic habit; which is increased by sloth, indolence, debility, in consequence of fever, dejection of spirits, and inattention to cleanliness. . But the distemper seldom becomes general, or alarming, except cold and moisture be conjoined with the causes above-mentioned.

Many ingenious physicians and philosophers have exerted their talents to discover a cure for this destructive malady at sea. But their views having been commonly influenced by theoretical opinions concerning the proximate cause of the distemper, it is not to be wondered, that their proposals, when brought to the test of experience, have proved inadequate, and fallacious.

Among the various theories, concerning the cause of this disease, and the mode of operation of its remedies, none, when I entered upon practice, seemed so ingenious and plausible, as that of the late benevolent Doctor M^r Bride.

The scurvy, by the united consent of physicians, was considered a putrid disease. By a number of well-conducted experiments * he endeavoured to prove that *fixed air* is the cementing principle of all bodies, vegetable as well as animal: and, that living animal sub-

* M^r BRIDE's Experimental Essays, *passim*.

stances become putrid, from the escape of this subtle vapour.

The cure of the scurvy was also known to yield to nothing certainly, but to fresh vegetables; whether *acid* or *alkaline*, *mild* or *acrid*, *sweet* or *bitter*. By various experiments, this ingenious physician found that these vegetables, however opposite their sensible qualities appeared, all possessed one common property, viz. that, when mixed with any animal substance, and placed in a proper degree of heat, they ran into fermentation, and threw off a considerable quantity of *fixed air*, endowed with the power of correcting putrefaction; and restoring soundness to corrupted animal substances.

Having, by experiment, also made it probable, that the cure of the scurvy depended entirely upon the fermentative quality of the vegetables employed, he judged that any substance, proper for food, abounding with fixed air, which would keep long sound, and take up little room at sea, would prove a convenient and powerful antiscorbutic. Wort or an infusion of malt, from containing a great quantity of fixed air, he supposed similar in its qualities to fresh vegetables: and, therefore, proposed *dried malt* to be kept in constant readiness on board of ships as a remedy, whenever this destructive disease made its appearance.

Captivated by the ingenuity of this theory, I was glad to be informed, when the scurvy appeared amongst the crew of the Talbot off the Cape*; that there was a cask of malt on board; and still more so to find that it was perfectly sound. As the quantity seemed sufficient only to give a full trial in a few cases; six patients were selected, and the wort was made by pouring three mea-

* See part I. page 15

sures of boiling water on one of fresh ground malt. After standing four hours, the liquor was strained ; and one bottle given to each patient, which, as it agreed perfectly with the bowels, was soon increased to two quarts daily.

There being no live stock on board, the dinner of the patients consisted of boiled rice, with sugar, and a little wine: and, for breakfast and supper, they had each a pint of panado, made with powdered biscuit and wort.

Two of the patients continued the wort; and the above regimen regularly for eighteen days ; and the other four from eight to ten days. I narrowly watched the progress of the symptoms: but had the mortification of observing the distemper to increase daily ; and the patients to become weaker and worse, than those who were put upon other articles of regimen*.

* The True Briton Indiaman sailed from St. Helen's on the 20th of April 1770, and did not make the coast of Malabar, till the 13th of December following. In the beginning of November the scurvy appeared amongst the crew; and, on the 20th, Mr. Foreman, the surgeon of the ship, began to give the wort, as directed by Dr. M'Bride, to two of the patients. Four more were, soon afterwards, put upon the wort; which they continued, with great perseverance, for fifteen or sixteen days. But the symptoms in all rapidly increased; and some of them became so weak, that it was dangerous to move them. After they gave over the wort, they were allowed some lemon-juice; and had a pint of port wine daily. The disease, notwithstanding, arrived to so great a degree of virulence, that fresh meat and vegetables, which they procured at Cochin, on the 18th of December, did not check the progress of the symptoms in these patients: and all the rest of the scorbutics also, except such as were slightly affected, grew daily worse, till they were sent ashore, on the 26th, at Tellicherry; where one of the patients, who had taken the wort, died of the distemper.

Captain Cook, in his paper presented to the Royal Society, observes, that " he is not altogether of opinion that the wort will be able

Having a little lemon-juice on board, the patients whose cases were farthest advanced, after they gave over the wort, were allowed two spoonfuls thrice a day ; and some of them, along with the lemon-juice, were ordered

to cure the scurvy, in the advanced state, at sea ; yet he is persuaded, that it is sufficient, along with proper attention to other things, to prevent the distemper from making any great progress for a considerable time." But, as he aided the wort with so many other excellent preventatives, such as *sour krout, rob of lemons and oranges, portable soup, and sugar* ; it is improper to place the preservation of his crew to that article. However in his last voyage, during which he unfortunately lost his life, the crews of the *Resolution* and *Endeavour*, although they were absent above four years from England, had not a single symptom of the scurvy amongst them, notwithstanding the wort was *never used* : and upon opening the malt and hops at the Cape, on the homeward passage, it was discovered that they were totally spoiled.—*Cook's last Voyage, vol. III. page 418.*

But the following circumstance, in addition to what has already been advanced, will put it out of all doubt, that wort, unless assisted by fresh vegetables, or fruit, will neither *prevent* nor *cure* the scurvy.

"A gentleman who is now lieutenant in his Majesty's navy, and who commanded a ship last year on the Southern Whale-Fishery, informed me, that not only his people, but he himself, became scorbutic during the voyage; notwithstanding great care had been taken in salting the meat, and furnishing the ship with the best provisions of every species; so that even when they returned to England, their provisions, of every kind, were sound and good; but particularly their biscuit, which had been kept in tight casks.

"They were likewise provided with a considerable quantity of good malt; which, as soon as the scurvy began to make its appearance, they used very liberally, not only by drinking its infusion, but by stewing it, and cooking it in different ways;—and although they were a good deal on shore at Port Desire, Penguin Island, &c. on the Patagonian Coast, yet, as there were no fresh vegetables of any kind that they could use, they could not check the progress of the disease." *Thomson's Essay on the Scurvy, 1790, p. 140.*

one dram of bark every four hours. Whilst this acid lasted, the disease remained stationary : but the weather being extremely stormy, the hammocks wet, and the ship dirty ; no progress towards recovery could be perceived, nor indeed expected.

All the others, ill of the scurvy, had the usual medicines, which are given at sea ; calculated, indeed, only to support hope, or at most to palliate some particular symptoms. The chief of which were gentle laxatives, when costive ; diaphoretic medicines, at bed-time ; bitters with vitriolic acid ; fomentations ; and antiseptic gargles.

They were supported with as cordial a diet as the ship could afford ; such as boiled sago and rice, with sugar and wine. The last article was, indeed, distributed with the greatest liberality and humanity, by Sir Charles Hudson ; and mango shrub was given to several by the officers, in such portions as were deemed proper. The disease, however, daily increased ; and, when we came to an anchor at Madagascar, many were so weak, that it was judged unsafe to send them ashore for some days, as has been already mentioned*. But still it afforded great consolation, after a voyage of nineteen weeks, and a considerable part of the time passed in the cold tempestuous latitudes off the Cape, that we were able to preserve the lives of the sick ; and that none fell a victim to this virulent distemper.

In our run between St. Helena and England, in the same voyage, two scorbutic patients were cured at sea by rob of oranges, which was prepared at Madagascar,

* Part 1, page 15.

taken daily in the form below*. But it is necessary to remark, that they had the benefit of fresh meat from the Captain's table; and that the ship was kept more clean and pure than when she was off the Cape of Good Hope.

When the scurvy appeared in our homeward passage, between St. Helena and England, in the year 1772†, being still unwilling to relinquish the idea of the possibility of curing the scurvy by throwing a large quantity of fixed air into the stomach, I tried the effects of two remedies in eight patients. The first was beer made from porter‡, which soon runs into a strong fermentation, and generates much air. It was made fresh every day: but, by mixing a bottle of the old liquor with the fresh ingredients, its briskness was much heightened. The other was an ale made from crude tartar §, recom-

* Take of Rob of oranges half an ounce,
Mountain wine a pint,
Refined sugar two ounces. Mix them together; and take one quarter four times a day.

† See part 1, page 35.

‡ Porter Beer.

Take of Porter two quarts,
Grated ginger two drams,
Soft sugar half a pound,
Water four quarts.

Put the liquor into strong bottles, and cork them well. One bottle may be used daily for drink, and another made into panado for breakfast and supper.

§ Tartar Ale.

Take of Crude white tartar powdered three ounces,
Juniper berries bruised four ounces,
Lemon-peel one ounce,
Ginger in powder two drams,
Cloves in powder one dram,
Coarse sugar five pounds,
Water six gallons.

mended by my valuable friend, the late Sir John Silver.

Two patients were put upon the use of the porter beer: one of whom also took three drams of the bark for some time daily. After using the beer for a month, the symptoms had not increased; but still several scorbutic spots remained, when he went ashore. In the other patient, for ten days, the progress of the distemper was checked; but the weather afterwards becoming cold and damp, the symptoms increased rapidly. He continued the beer from the 6th of August to the 1st of September, as he was extremely fond of it; and, when he became weak, was also allowed a pint of wine daily. Notwithstanding this, he became daily worse. On the 1st of September, arriving in the Downs, he was supplied with vegetable soup, and I kept him on board, to see the progress of his recovery, in a ship which was crowded and dirty. After four days trial, all his former complaints remaining, he was sent on shore; where he recovered in a very short time; which he imputed to dry apartments and living upon good soft bread, roasted beef, and porter: for, having experienced so little benefit from fresh vegetables on board of ship, he said he used none after he went on shore.

The other six patients, ill of the scurvy, had an allowance of tea, wine, and sugar; and fresh meat, when it could be spared, for dinner. They took two quarts of tartar ale daily. However they all became worse;

Boil them half an hour; then pour the whole into a tub; and, when nearly cold, pass the liquor through a strainer into a six-gallon cask. If it do not soon ferment, add half a pint of porter.

It may be given, a few hours after the fermentation has begun, from one pint to two quarts daily.

and, had our passage been much longer protracted, it seemed more than probable that several would have fallen sacrifices to the distemper.

From what has been advanced, it will readily appear, that, when the scurvy has attained any degree of vigour, nothing will cure it, whilst the patients are confined to dirty hammocks, and the damp air of a ship. Lemon-juice, porter, wine and sugar, may for a little check its progress, and enable nature longer to support the conflict. But, when it has arrived to any degree of virulence, dry air, dry clothes, and good nutriment will be found of more importance than all the boasted powers of medicine.

As it does not appear, therefore, that the scurvy can ever be cured at sea, whilst the causes which induce it subsist in any great degree; it is the express duty of those who have the command of ships, to prevent its formation by every means, which Providence has suffered mankind to discover. But the farther consideration of this subject shall be left to the third part of this work.

CHAP. IX.

OBSERVATIONS ON THE RHEUMATISM.

THIS disease, though by no means frequent in hot climates, sometimes attacked the common seamen, from getting wet, or sleeping upon deck in the night-dews. Sometimes also it was the consequence of the remittent fever or the dysentery. In the first case, it was generally acute, or accompanied with fever; and, in the last, always chronic.

In the acute rheumatism, if the symptoms of inflammation ran high, bleeding was necessary. The patient was confined to a cool regimen, and a free perspiration kept up by diluting liquors, with small doses of emetic tartar or antimonial wine. If the pains became fixed to the joints, blisters were of great use, and frequently removed the complaint.

When the chronic rheumatism was the consequence of long continued fevers or obstinate fluxes, I was seldom disappointed in curing it, by sweating the patient with small doses of Dover's powder*; which, however, ought not to be continued for any length of time, as it reduces the strength. This course should be omitted for two or three days, and then begun again, taking once or twice a week, especially when costive, the guaiac draught, No. 29. When the pains have continued obstinately fixed, I, in some instances, experienced advantage from the application of the liniment, No. 30.

* Pulv. Ipecacuanhæ Comp. Ph. Lond.

When, by these means, the pains are removed, the Peruvian bark, and the use of the cold bath, seldom failed to complete the cure; and to confirm the health of the patient.

Some cases of the chronic rheumatism came under my care, where the pains had been confined to some particular part of the body, as the shoulder, the joints of the knees and arms; which resisted every usual remedy. At last the disease was totally and expeditiously removed by rubbing mercurial ointment * upon the parts affected. The common mercurial pill was given at the same time. As a salivation rendered the cure more tedious, these medicines were generally laid aside before they produced this effect.

From the great success which attended this practice, I was at first induced to believe that the rheumatism was joined with venereal pains: but I afterwards found it as effectual, in several instances, where there was no reason to suspect any lurking taint of this nature †.

After settling in this island, in 1773; in every case of obstinate rheumatism, resisting the usual treatment, I had recourse to mercury. But as it was necessary to conceal the medicine from the patient, I trusted entirely to calomel combined with opium. It was given from one to two grains every night at bed-time, with a sufficient quantity of opium to ease pain; and, if the distemper did not soon yield, it was increased, till such time as the

* Unguentum Hydrargyri Fortius, Ph. Lond.

† In the year, 1771, Dr. Fothergill's paper on the use of calomel in the sciatica appeared. It gave me much pleasure, to find the efficacy of mercury confirmed, by the authority of so accurate a Physician, in this obstinate species of rheumatism. See MEDICAL OBSERVATIONS, Vol. IV. p. 69.

patients complained of some degree of tenderness in the mouth. By this procedure I was seldom disappointed in removing rheumatism, however obstinate.

Since I was elected Physician to the Infirmary, in Newcastle, in 1788, without reckoning the out-patients, I have given mercury to fifty in-patients in rheumatism, whose cases were selected on account of their long duration and obstinacy. When the distemper resisted the internal use of mercury, the ointment was rubbed upon the parts affected; and continued till the system was saturated. Of the number above-mentioned, forty-six patients, several of whom had laboured under sciatica, lumbago, or pains fixed to some of the large joints, not only for months, but for years, were completely cured; and the remaining four much relieved*. In obstinate cases it was necessary to keep up the action of the medicine for some time; but, in every instance, care was taken to avoid profuse salivation.

The acute rheumatism, attended with much fever, and with pain and swelling travelling from joint to joint, is perhaps as distressing a disease as any to which the human body is subject. By the common antiphlogistic treatment the fever is usually soon subdued: but the pains too frequently remain, and the patients become subject to violent torture, not only for many weeks but months.

Having too frequently been an eye-witness of this miserable change of the rheumatism from the acute to the chronic state; even when the distemper had been treated by the ablest Physicians, not only in private practice, but in hospitals, before I left England; I was determined,

* In the Dispensary, from 1777 to the present time, 215 rheumatic cases have been admitted under my care, of whom 198 have been cured; nine relieved; and eight dismissed for irregularity.

upon my return, to have recourse to mercury, which I had experienced to be a most powerful remedy in obstruction and inflammation.

In the first cases, therefore, of acute rheumatism which occurred, after bleeding, I began the use of calomel with opium. Three or four grains were given the first night; and it was continued afterwards, sometimes to two, and sometimes only to one grain at bed-time, till the complaint began to abate; taking care not to push it farther, even in the most violent cases, than slightly to touch the mouth. Whilst the fever continued, antimonials in small doses, so as not to occasion nausea or purging, were, at the same time, given during the day; and the patient kept upon a temperate regimen. By this procedure the fever was soon relieved; and the pain and swelling removed.

In my latter practice, I have seldom used bleeding, except the inflammation of the parts has been considerable, or the distemper attended with a pleuritic stitch. Nor have I often had occasion to apply blisters to the parts affected with the rheumatism; nor seen those effusions of gelatinous fluid in the sheaths of the tendons, which sometimes have happened under the common treatment: so powerful are the deobstruent effects of mercury in this distemper.

By this treatment the 'chronic state of the' disease is almost certainly prevented. And since I began this practice, I have not witnessed a single death in the rheumatism; an event which has frequently happened, when bleeding and evacuations have been carried to a considerable extent.

The common received opinion, that mercury acts chiefly by its stimulant power, has very much limited the use

of this excellent remedy. When no feverish state subsists, it is certain, if it be intemperately introduced into the habit, so as to occasion swelling and inflammation in the throat or mouth, it will induce quickness and hardness of pulse; and every other symptom of the *phlogistic diathesis*. But, if it be cautiously prescribed, where fever already exists, as in the acute rheumatism, so far from occasioning stronger action of the vessels; as soon as the system is saturated, all the symptoms will presently abate; and soon totally disappear.

Mercury I have found so useful in subduing a multitude of diseases of very different and opposite natures, that I cannot impute its efficacy to one quality only. Many distempers, depending upon obstruction and inflammation, seem to yield to its wonderful deobstruent powers. But, perhaps, still a great number, arising from other causes, are subdued by its inducing and supporting a condition or state of the system, totally opposite to that of the existing disease. In this way, it is probable, it removes the dry belly-ach, some cases of dysentery, the tetanus, hydrophobia, and other spasmodic affections. And on this principle I have given it in four cases of recent insanity with the most happy effects.

CHAP. X.

OBSERVATIONS ON THE VENEREAL DISEASE.

IN the former edition of this work I entered more fully into the consideration of venereal infection, than I judge to be necessary in this, as the subject has been of late exhausted by the judicious dissertations of Dr. Simmons, Dr. Swediaur, Mr. Hunter, and Mr. Howard. I shall, therefore, content myself with offering a few remarks on the treatment, so far as it seems to be connected with a hot climate.

Although I have already recommended the use of mercury in several dangerous states of diseases, resisting the common treatment; yet, in hot climates, I am so far from considering it to be friendly to the constitutions of Europeans in general, especially in long voyages, that I would never advise it to be exhibited unless necessity demand its use.

In recent gonorrhœa, the principal object of the cure was to guard against inflammation. The patient was, therefore, confined to a cool regimen: the body was kept open by the mildest laxatives; and the heat of the urine blunted by mucilaginous drinks. General and local cleanliness was attended to; and injections thrown up the urethra three or four times a day. During the inflammatory state, the injections were of an emollient sedative nature, and used warm: but, as soon as the painful symptoms had abated, they were of an astringent nature*, and injected perfectly cold.

* The astringent injections which I used generally in my voyages to India, either consisted of half a dram of sugar of lead; or one grain

In the mild gonorrhœa, when such a course was begun in time, notwithstanding the many assertions to the contrary, in my voyages to India, I never saw mercury necessary to complete the cure. But, in several cases which came under my care, either from neglect, improper treatment, or the peculiar virulence of the infection, the distemper resisted the common antiphlogistic treatment. It then became also necessary to give mercury not only to subdue the violence of the local symptoms, but to secure the constitution against the effects of absorption.

When the gonorrhœa was accompanied with chancres, warts, or raspberry-like excrescences, local applications seldom, removed these symptoms radically. On the contrary, the excrescences generally required as much mercury to subdue them as if the distemper had been constitutional. Nay they would often sprout up again, after the habit was freed from every other suspicion of venereal taint; notwithstanding they were frequently destroyed by caustic and escharotics. But, at last, they would often disappear of their own accord.

When the disease was confirmed, I trusted to the simple preparations of mercury, such as purified quicksilver extinguished in mucilage, honey, or rhubarb*, either

of corrosive sublimate dissolved in eight ounces of soft water; or in such proportions as the urethra could bear without much irritation: since that period I have, with advantage, added opium to these injections.

* Of all the different articles which I have employed to extinguish quicksilver, rhubarb answers the purpose most speedily and effectually. The following was the form I used. Take of quicksilver one dram, rhubarb one scruple. Moisten the quicksilver with any syrup to the consistence of honey; and grind them till the globules of quicksilver

made up into pills, or in the form of the mixture, No. 28. At the same time opiates were given to prevent the mercury from running to the bowels. In the worst cases, inunction with the strong mercurial ointment was preferred to the internal use of mercury.

As there was no possibility of ascertaining the quantity of mercury different constitutions would bear, it was always necessary to begin with small doses, and to increase them gradually. If, during this course, symptoms of salivation appeared, it was immediately suspended; and afterwards never carried farther, with design, than to occasion slight soreness of the mouth.

When these preparations of mercury did not succeed, others were used. Those which I oftenest tried were the precipitate from calomel of Dr. Saunders, or Plummer's powder. The solution of sublimate was found very precarious. It had a bad effect upon the stomach; and at best only suppressed the symptoms.

When the use of mercury becomes necessary in hot climates, especially in unhealthy situations, half an ounce of bark should be taken daily, during the whole course; which enables the constitution to bear a sufficient quantity to subdue the disease. Before I prescribed the bark in this manner, I had several cases under my care, where a small quantity of mercury, whether used internally or externally, ran speedily to the mouth, and weakened the patient, without having much influence on the distemper.

During the mercurial course, the strength should not be allowed to sink. The patient ought, therefore, to be totally disappear. Then add a sufficient quantity of powdered liquorice, or crumb of bread, to reduce the whole into an uniform mass; to be made into sixty pills. From three to six may be taken night and morning.

supported by a cool nourishing diet. He should not use any violent exercise, nor expose himself to the heat of the sun : nor should he put any additional covering upon his head.

If such gentle treatment be followed in the beginning ; and the bark and opium be taken along with mercury, the disease may be almost always removed without any risk to the constitution.

CHAP. XI.

OBSERVATIONS ON THE TETANUS.

THIS spasmodic affection has obtained different names according to the parts affected. If the head and trunk be rigid and immoveable, it is strictly named *tetanus*. If the jaws be so fixed as the patient cannot open his mouth, it is called by some nosologists* *trismus*, but more expressly in English the *locked jaw*. If the body be bent backwards in a curve, it has been termed *opisthotonus*, and if forwards, *emprosthotonus*. But, under these forms, the disease is essentially the same, arising from the same causes, and differing only in degree.

This violent and dangerous spasmodic affection is most frequent in hot climates; and most commonly originates from wounds, punctures, lacerations, and contusions, especially of the toes and fingers; and, what is very remarkable, oftenest from those of a slight nature. It is also produced by exposing the body, when over-heated, to cold air; to wet; and exhalations from damp grounds.

The *tetanus*, in an extensive sense, may be defined a painful, rigid, and immoveable contraction of the parts affected, but especially of the muscles of the jaws and back: for although the spasms suffer severe exacerbations, yet, so long as the distemper lasts, the contraction of the muscles never abates so much as to allow of the proper action of their antagonists. But besides this permanent contraction of the muscles of the parts primarily affected, the *tetanus* also seems to be compounded of transient spasms of the muscles of other parts of the body, occasioning various twitchings.

The disease, for the most part, comes on slowly, and

* Sauvages. Cullen.

is, therefore, in the beginning, often mistaken for some rheumatic affection of the neck. The first symptoms generally are, slight stiffness of the neck and jaws, and some difficulty in swallowing. As the complaint advances, the muscles of the jaws are affected with rigidity, which increases so much that the patient is not able to open his mouth: and the neck and dorsal muscles become so strongly contracted, as not only not to suffer the least flexion of the body forwards, but strongly to bend it backwards. At this time, most commonly, strong convulsive transitory spasms seize the under-part of the *sternum*, and extend to the back: and every attack of these spasms fixes the lower jaw more firmly, till only a small aperture be left between it and the upper. Sometimes indeed the teeth of both jaws meet so near as not to allow even liquids to be put into the mouth.

Under the most violent degree of the distemper the muscles of the extremities become rigid; as also those of the *abdomen*: and, in this last case, if the dorsal muscles, which are the strongest, be not affected, the body will be bent forwards* instead of backwards; or, in other words, the patient will labour under *emprosthotonus*. This last form, however, seldom, in modern times, appears with that degree of contraction, so as to fix the chin down upon the *sternum*, as mentioned by the ancients. When the distemper is completely formed, the torture of the patient is severe beyond description; and a general convulsion most commonly appears, which puts a period to his miseries.

During the whole course of the *tetanus*, the pulse is rarely accelerated. The heat is seldom above the standard of health: on the contrary, the body, but more especially the extremities, are cold.

* See note, p. 80.

The *tetanus*, when left to nature, is generally mortal ; and, if completely formed, rarely yields to art. When it seizes suddenly, and violently, in consequence of wounds, the patient is soon carried off ; and seldom survives the 4th, 6th, or 7th day. But, when it arises from cold and comes on slowly, especially when the patient gets beyond the eighth day, there is considerable chance of recovery, if proper means be assiduously employed.

Having premised these particulars, I shall proceed to give a detail of the two cases, which occurred in my last voyage to India. The first, though unsuccessful, is introduced not only to guard the inexperienced from being deceived by the insidious attack of the distemper, which, in the beginning, appeared to be of a very trivial nature ; but also to evince the dangerous consequences, which must ever result from feeble practice, when this dangerous spasm is formed.

I. JOHN STAFFORD, Seaman, after sleeping in the long boat, during a cold night, in his return from Canton, on the 6th of February, 1772, complained of an uneasy stiffness of his neck, and some difficulty in swallowing, with general lassitude. Having no feverish symptoms, his ailment was conceived to be of a trivial nature. A diaphoretic draught, with twenty drops of tincture of opium, was prescribed at bed-time ; and he was desired to promote sweating by warm sage-tea.

February 7th. Although he had been in a gentle sweat during the night, the rigidity of the neck, and difficulty of swallowing continued : and, upon touching his neck and jaws, the muscles felt hard. Desiring him to open his mouth, I was exceedingly surprized to find that it was not in his power ; and that the aperture, between the teeth of both jaws, did not exceed half an inch. The

patient, however, thought little of his complaint, and observed, that he had been similarly affected on the coast of Guinea, merely from catching cold; which disappeared of its own accord. He was bled to ten ounces; and took a laxative. At night he could open his jaw, which relieved my apprehensions. But he still complained of difficult deglutition, although his throat, upon inspection, had no appearance of disease. A bolus, with five grains of camphor, and one of opium, was given at bed-time, and ordered to be repeated if occasion required.

8th. He sweated profusely during the whole of last night. Took another bolus, early in the morning, and was in a perspirable state when I visited him. His neck and jaw however still were stiff; and he said he had got no rest in the night from transient, but painful cramps. During the time I was making inquiries, if he had lately received any external injury, he was seized with pain at the pit of the stomach, and strong convulsive spasms of the muscles of the *abdomen*. One moment he was drawn forcibly forwards, and the next he fell backwards in his hammock. These spasmodic contractions returned several times in five minutes; and, from the torment which attended them, large drops of sweat ran down his forehead. He at last recollected that, when he went into a boat, on the 24th of January, he had bruised the ring-finger of his right hand; but so slightly that it had never occasioned the least uneasiness. The joint of the finger, upon examination, appeared a little swelled: the nail was loose, but there was no discharge of matter.

Having now no doubt concerning the nature of his disease, a draught with two grains of opium was immediately given: the nail was removed; and an incision made in the finger down to the bone. As soon as the

blood stopt, it was dressed with warm digestive. An emollient poultice was laid over the dressings, and ordered to be repeated frequently.

Being obliged to go to Canton for a few days, I left the patient under the care of a Surgeon, after explaining the nature of his complaint; which indeed was now so dreadfully formed as to admit of no ambiguity; and requested him to give opium in large and repeated doses, so as to mitigate pain; and to use either fomentations or the warm bath occasionally.

The sequel of the case is abridged from the minutes of the gentleman who attended.

9th. The finger began to digest. Although he had taken two grains of opium, he continued in a restless state during last night. The jaw was completely fixed, and felt very hard and stiff: the muscles of the *abdomen* were contracted, and he was drawn forwards. He continued in great agony; had a retention of urine, but passed some in drops with much pain. Having taken only two draughts with opium, he experienced no relief. At night his jaw and neck continued very stiff and hard: the muscles of the *abdomen* were in the same state; and the pain was excruciating when attempted to stand erect. The draught with opium was given at bed-time.

10th. The rigidity and hardness of the muscles of the *abdomen* increased; and he could neither sit erect nor stand, from a violent spasm drawing him down from the *sternum* to the *pubes*. He was in great agony during the whole day; and kept constantly in a reclining posture with his head bent forwards. No opium was given this day till bed-time, when he took two grains. The whole of the endeavours of the Surgeon were directed to the suppression of urine. Fomentations and diuretics were

given; and the catheter tried to be introduced, which was prevented by the spasm. At night two grains of opium were prescribed.

11th. He was in the greatest agony in the night: made no urine. The muscles of the jaw, neck, and *abdomen* continued equally hard and rigid. But he had only pain from the strong spasm of the *abdomen*; which still made the Surgeon believe that the distemper proceeded chiefly from suppression of urine. The catheter was this day introduced into the bladder, but no urine was drawn off. He was put into the warm bath, which gave temporary relief. At noon he was in extreme agony from convulsive twitchings and the pain in the muscles of the *abdomen*. In the afternoon he was seized with a general spasm, and died instantly. As soon as he expired, the rigid muscles of every part of the body became pliant; and his urine was discharged to the quantity of half a pint.

II. JOHN PENNICK, aged 26, on the 13th of April, 1772, in jumping from the booms, sprained his anele. An hour after the accident, being in great agony, I was sent for to visit him. He had constant transient convulsions of the muscles of the leg and thigh; the pain of which made him sweat profusely. Upon examining the part sprained, nothing could be observed, except a small puffy tumour near the *tendo achillis*. When the foot was brought forwards, in an acute angle, the pain instantly ceased; but, upon letting it go so as to relax the tendon, the tremors and pain recurred with great violence. The foot being secured by a bandage in the position before mentioned, he continued perfectly easy for some hours, which induced him to believe that the cramps would not return. But, upon taking off the bandage, he suffered much from his temerity. Two drams of

tincture of opium were rubbed into the part affected, which, together with replacing the bandage, totally removed every painful sensation. Some hours after this, he thought himself well; and, being a very active fellow, would not stay below. He, therefore, again removed the bandage, and returned to duty.

On the 25th of September, he was seized with spasms between his shoulders, which prevented him getting any sleep in the night. On the 26th, being in extreme torture, I was sent for, and found him in the following state. Severe spasmodic contractions, seizing the muscles, forcibly drew back the *scapulæ* almost in contact with each other. In a moment the spasms changing their situation, and striking across the ribs to the *sternum* as violently, in jerks, drew the head towards the breast. These contractions returned with severity eight or ten times in a minute; the momentary relaxation allowing some little respite from pain. In the night, he observed he could scarcely open his mouth from rigidity of the jaw; and that he had been able to void no urine for twenty-four hours. Thirty drops of tincture of opium were immediately given, and ordered to be repeated according to the urgency of the spasms. The muscles affected were likewise embrocated with a camphorated liniment and opium. After taking three draughts, the spasms were mitigated; but at night he complained of difficulty in swallowing.

On the 27th, the muscles of the neck, spine, and jaw, were more rigid; but the spasmodic twitchings were kept tolerably easy by opium. In the afternoon, as he complained of confusion of his head, the opium was given less frequently. One dram of *asafoetida*, in solu-

tion, was prescribed every two hours, and five grains of calomel occasionally when costive.

On the 28th and 29th, he had frequently the hickup. The other symptoms were the same. On the 30th, after passing a good night, he seemed much better; and, on the first of May, was free from every complaint, except weakness.

Having given over taking both the *asafoetida* and opium, on the evening of the 2d of May, his complaints recurred with great violence. His jaw was so firmly locked, as only to leave a small opening between the teeth. The *scapulae* were drawn towards each other in convulsive jerks; and his body was bent forwards, at times, by a strong spasm seizing the *sternum*, the *abdomen*, and ribs. His left eye was dull and watery. After every severe attack of these transient spasms, he complained of faintness. Five grains of calomel were given; and opium was ordered to be continued freely. He refused the *asafoetida*. The jaw was locked during the whole day. He swallowed at night with difficulty; and complained of an uneasy sensation in the gullet, which he compared to the beating of a watch.

May 3d. He sweated much during the night, but got no rest. His jaw was less rigid, and he could open his mouth a little wider; but the stricture at the pit of the stomach was distressing.

4th. He was seized with violent contractions of the muscles of the neck, and chin; and his jaws became again firmly fixed. Forty drops of tincture of opium were given in a dose of the camphorated julep; and repeated according to the urgency of the spasm. But as the opium had hitherto only afforded temporary relief,

I was now determined to saturate the system with mercury : therefore, besides the use of calomel, two drams of strong mercurial ointment were carefully rubbed into the jaws, and neck.

5th. In the morning he could open his jaw ; but, strong spasms seizing him at mid-day, it became again strongly fixed. Two drams of the mercurial ointment were rubbed into his legs and thighs : and the opium was continued.

On the 6th, the hickup attacked him with severity. On the 7th, he could open his jaw, and was free from spasms. His mouth was tender, but no salivation was produced. Wine, for some days past, was allowed freely : and he was now ordered one dram of the bark every three hours. The opiate was continued at bedtime.

From thistime he began to recover : and again returned to duty on the 10th of May. He was desired for the sake of security to continue the bark ; and to bathe in a tub of sea-water. But thinking himself perfectly secure, he neglected these precautions.

On the 19th of May he was seized more violently than ever. His neck became rigid ; his jaws fixed ; and the convulsive contractions affected various parts of his body. The same means were again had recourse to. Opium always afforded temporary relief. All his complaints disappeared by the 25th of the month, except a slight hickup after swallowing liquids. He afterwards used the cold bath every morning for some weeks ; and was restored to his usual health.

After getting frequently wet, on the 20th of July, he was again seized with spasms in a very violent manner ; which, however, were mitigated after taking six grains

and a half of opium; and, in four days, disappeared under the moderate use of the same medicine.

In exhibiting opium in the *tetanus*, the dose must be increased so as to relieve the violence of the pains and spasms. The quantity which may be taken, without affecting the head or producing sleep in this disease, is astonishing. Dr. Huck*, in a case of locked jaw, arising from a wound, and which terminated successfully, began with one grain of opium every three hours. But by the ninth day the dose was, from necessity, increased, so that the patient, at proper intervals, consumed every twenty-four hours, one dram of opium, and half an ounce of musk, rubbed down with sugar, in a pint of common julep. This quantity however is trifling in comparison to what is sometimes required in so painful a distemper. Dr. Gloster†, of Antigua, in a case of locked jaw in a negro, aged 40, whose disease also terminated favourably; on the second day began with giving five grains of opium every third hour, in a powder joined with camphor and nitre. The opium was gradually increased. It was afterwards united with musk and cinnabar, and at last given to the extent of twenty grains every third hour. For six days the relief was inconsiderable. But after this the symptoms gradually abated: and, in thirteen days more, were so much diminished, that it was judged unnecessary to continue the medicine. During the first seventeen days, the patient took, in all, *fifteen hundred grains* of opium, without producing the least affection of his head. During the whole time he also had very little sleep.

* *Medical Observations*, Vol. III. p. 333.

† *Transactions of the American Philosophical Society*, Vol. I,

Although many cases have been recorded of the beneficial effects of opium in this disease, yet it so often failed in Jamaica, that a gentleman of the faculty there was induced to prescribe mercury. The patient was rubbed two or three times a day with mercurial ointment, till such time as a salivation was raised. As soon as the mouth became affected, the spasms left the jaw, and the transitory convulsions soon ceased. Every case, coming under his care, was treated in this manner. Twelve patients were cured, who were all who applied early enough to afford time to bring on a salivation before the fatal period. But it is proper to observe, that none of these cases proceeded from wounds, but merely from the effects of climate*.

The effusion of cold water recommended by Hippocrates, and again proposed by Dr. Lind, has been lately carried into execution in the *tetanus*, by Mr. Cochran, of Nevis†, and Dr. Wright, of Jamaica‡. The patient is ordered to be stripped naked, and two or three buckets of cold water to be dashed against his neck and body; every three or four hours. He is afterwards rubbed dry and laid into bed; and moderate sweating encouraged. In the management of this process Dr. Mosley very properly observes, that it is only to be repeated, while it continues to moderate the spasms, and to keep up heat on the surface of the body; and that it will destroy the patient either when he is covered with cold sweats, or with profuse perspiration§.

* *Physical and Literary Essays*, Edinburgh, 1771.

† *Medical Commentaries*, Vol. III. p. 183.

‡ *Medical Observations*, Vol. VI. 143.

§ Mosley on Tropical Diseases, p. 495.

Dr. Rush, from the *tetanus* being prevalent in hot climates, concludes that it is occasioned by relaxation ; and therefore, most likely to be cured by tonics. This hypothesis induced him to try the effects of bark and wine. The former he prescribes from two or three ounces, and the latter, from one bottle to three pints in the day. He relates two cases which terminated favourably under this treatment. But, in one of them, after the stimulating powers of bark and wine lost their effects, he added oil of amber in large doses. In a subsequent paper he mentions two other cases, which were successfully treated by wine and mercury*.

Such are the practices which have been recommended in this dangerous distemper. But it is to be regretted, when those different measures have been carried into execution by Medical Gentlemen, who reside in countries where the disease is most prevalent, that disappointment has too frequently been the consequence. A friend of mine returning from Jamaica, where he has practised for above eighteen years, candidly informs me, that, alone, and in conjunction with others, he has tried all the remedies proposed, but rarely with success after the spasms have been completely formed.

In none of the fatal cases, which he related was mercury so early given, as to produce its proper action upon the system. Nor does it appear that he, or practisers in general have availed themselves of the united powers of the remedies which have been proposed.

The disease being of a most violent, rapid, and dangerous nature, the system ought to be speedily and powerfully acted upon. Too much has been trusted to opium alone ; which is only palliative, or at most enables nature

* Rush's Medical Inquiries, 3d Edit. p. 195, 208.

to combat the disease. With these views let it be given : but, along with it, let calomel be joined, and mercurial frictions liberally employed, on a large surface, during the first days of the distemper. At the same time, let the body be soused with cold water, with the precautions* already mentioned, and wine given liberally.

These powerful agents cannot fail to impress the system strongly : and particularly, if the mercurial action, which is more permanent than that of any other medicine we are acquainted with, be timely produced, it is probable that the spasms will give way. At all events mercury can do no harm in a distemper, which, if not speedily removed, proves most certainly destructive. The frictions with mercury also have this advantage, that they do not interfere with other modes of relief.

The best means of preventing *tetanus*, in countries where it is prevalent, are to dilate the slightest wounds, and to bring them to digestion, by applying spirit of turpentine. Every person has observed the absence of all inflammation in the wounds and injuries which produce it : and Dr. Rush informs us, that he never knew an instance of *tetanus* arising from a wound where spirit of turpentine had been applied in time†.

The spasmodic affections‡, which appear upon the

* Page 311.

† *Medical Enquiries*, p. 200.

‡ See Part I. p. 80.

Dr. Girdlestone observes, that if the spasms were ever so general, with warmth of the extremities there was no immediate danger: on the contrary, if the spasms were ever so trifling, with coldness every danger was to be feared. This is agreeable to the observations of a Medical Gentleman of great discernment, who had resided near twenty years in the country. He informs me, if heat could not be speedily recalled, and the vomiting removed, the disease always terminated unfortunately.

coast of Coromandel, seem to have a near analogy to the cholera. The vomiting is a leading and dangerous symptom ; but if it and the coldness of the extremities can be removed, there is no immediate danger from the spasms. The spasms indeed differ from those which accompany the cholera, in not being attended with purging. But if we conceive a patient attacked with cholera, to be seized at the same time with strong spasmodic contractions of the muscles of the *abdomen*, and of the intestines themselves (which is actually the case, in the distemper under consideration) constipation must be in general the consequence.

With respect to the cure, according to the united consent of all the gentlemen with whom I have conversed, it is to be treated exactly as the cholera. Warm clysters with tincture of opium are to be injected frequently ; and opium is also to be given in a small cordial draught according to the urgency of vomiting. Every method to recal animal heat must be instantly put in practice. With this view bags of hot sand are applied to various parts of the body : the extremities are fomented, and afterwards rubbed with hot cloths. As soon as the irritability of the stomach is removed, the faculty at Madras place great confidence in the liberal use of hot Madeira.

POSTSCRIPT,

CONTAINING A

REPORT OF THE PRACTICE IN FEVERS, IN THE SHIPS IN
THE SERVICE OF THE HONOURABLE EAST-INDIA COM-
PANY, FROM THE YEAR 1770, TO 1785.

AS soon as I engaged to prepare the present edition of this work for the press, application was made to the Court of Directors for leave to examine the Medical Journals of the East-India ships, from their commencement in 1770. In consequence of which, an order was given for depositing the Journals in a commodious room, in the India House, for the perusal of any gentleman of the faculty I should nominate. And, to render the inquiry more useful, leave was also granted for taking extracts.

The motives, which more especially influenced this inquiry, were to ascertain the success of the practice in fevers, and to record any modern improvement, which might have been discovered for lessening the mortality, which so frequently happens in voyages to so distant a country.

That this inquiry might be properly executed, I prevailed upon a Physician of great discernment, abilities, and zeal for promoting the interests of his profession, to peruse the medical day-books and journals. Six months have been employed in this laborious work; and so indefatigable has my friend been, that I have now before me not only a report from every journal which has been

kept ; but also many cases of fevers, and some of other diseases, recorded by the Surgeons in the service, from the year 1770 to 1785.

Partial extracts indeed would have deserved no confidence : but, being in possession of the whole evidence, I shall proceed to give a report of the success of the practice followed in fevers, in as concise a manner as possible.*

From the materials in my possession, it appears that one hundred and eighty-nine cases of fevers are recorded in the journals ; in which the treatment and event are ascertained. But many patients are mentioned as having been attacked ; the number of whom, and the event of the diseases, are not specified.

Of the above number which are precisely ascertained, one hundred and five recovered, and eighty-four died.

In all the successful cases the bark was prescribed : but, in many, the recovery seems to have been retarded, by the long continuance of antimonials, and the too late and sparing use of the bark : for, in those cases, where it was early and liberally persevered in, the disease seems almost invariably to have been speedily subdued ; and the health of the patient soon restored.

In many of the unsuccessful cases, the bark was also prescribed. In two of these cases it was given early, but from the appearance of bile † or some other casual sym-

* Had the materials arrived in proper time, extracts from them might have been introduced to have strengthened the practice, recommended in several diseases already treated of. But they contain nothing to make me alter my opinion concerning the methods of cure which have been proposed. Some facts, which apply to the prevention of diseases, will be introduced in the third part of this work.

† A great secretion of bile in fevers, and in almost every other disease, is an effect and not a cause. I know of no distemper indeed,

ptom, it was soon left off, and bleeding, antimonials, and other evacuants substituted. In all the rest of the cases, which terminated fatally, the bark was not exhibited till within a day, or at most two, before the patient's death; and then generally only in decoction.

Many instances occur in which the bark subdued the fever, after bleeding, the frequent use of antimonials, and other evacuants. But, under this practice, it too often failed; and the patients were liable to be affected

which originates from bile, except the cholera or diarrhoea, in hot climates; and even not these unless a check be given to the cutaneous secretion. This symptom, in fevers of every country, never appears except where there is great irritability of the stomach. The only means of removing it is to allay irritation of that organ; to keep the bowels open, and to remove the original disease. The delusive theory of bile being the cause of fever, so universally adopted by the practitioners of physic in India, I fear, is likely to be attended there, with all the destructive consequences, which, in this country, has followed the equally ill-founded *phlogistic diathesis*. It gives rise to the continued use of emetics, antimonials, and purgatives, which, by increasing the irritability of the stomach, and the action of the gall-ducts, not only aggravates the symptom intended to be relieved; but, by sinking the strength already too much debilitated, renders the disease incurable. The remark of Sir George Baker, in the third volume of the *Medical Transactions*, when treating of the dry belly-ach, is so expressive of my ideas of the limited use of vomits in fevers; and of bile being only an effect, that I cannot forbear introducing it.

“An effectual emetic, given in the beginning of this disease, as it unloads the stomach from its foul contents, is advisable, and even necessary. But a frequent repetition of strong antimonial vomits, given with an intention to evacuate *the corrupted bile*, would only harass the patient most unprofitably. Those, who, on this principle, have recommended such a practice, have mistaken the effect for the cause. One might, with equal soundness of argument, maintain, that sea-sickness is excited by bile; a cough by a copious expectoration of *mucus* or an *ophthalmia* by the water that distils from an inflamed eye.”

with the scurvy, and other chronic complaints; which an early use of the bark totally prevented.

From the account of the journals before me, it gives me pleasure to observe, that, in the ships of those Surgeons whom I knew to have no prejudice against the early use of the bark, even when no remission happened, fevers were soon subdued; general sickness prevented; and few instances of mortality occurred.

Upon the whole of the evidence, it appears, that, when fevers of any consequence prevailed in the ships, either at sea, or at the different stations in India, mortality was almost invariably the consequence of bleeding and the continued use of purgatives, and antimonials. That, under a cordial regimen and moderate evacuations, succeeded even by a late use of the bark, many recovered: and that, under the early, liberal, and continued use of this medicine, not one instance of death is recorded.

But, in order to give a more comprehensive view, I shall subjoin a report of some ships individually, especially those where sickness was most prevalent.

THE JOURNAL of the THAMES commences the 12th of February, 1771, and ends the 31st of May, 1772.

In the outward passage to Bencoolen, thirty of the soldiers were affected with the fever; which is denominated putrid, of whom five died. Six cases are recorded, by way of illustration. One of the mortal cases had been previously treated for the itch, which was removed, by bleeding and repeated purgatives, by the 21st of February. On the 1st of March, the same patient is recorded under the title putrid fever. He was again bled, had a clyster, and other medicines, and died on the 15th of the same month. In another, venesection was prescribed, and he also died.

The general practice, however, seems to have consisted in the use of emetic tartar in small doses ; afterwards draughts with cordial confection and contrayerva ; and, at last, the bark in decoction to the quantity of two ounces, with one dram of the tincture of snake-root every four hours.

Twenty of the seamen are said to have been ill of the remittent fever previous to the 26th of August, 1771 ; of whom two died.

But the Surgeon of this ship, seems to have given the bark more freely, than in the cases recorded : for, in a letter addressed to Sir John Silvester, he observes, that, “ The most frequent disease was fever, which generally remitted or intermitted, and was easily subdued by the use of the bark. In a Bencoolen and China voyage, bark is the *great dependence* ; nor ought a ship to sail with less than thirty or thirty-five pounds of it.”

THE JOURNAL of the TRITON, which sailed for Bengal, in January 1772, and arrived in England in September 1773, only contains the following extract, worthy of notice.

“ From April to the 20th of May, 1772,” says the Surgeon, “ I was confined with a violent fever. This was also the case with the ship’s company, the sick list having increased to sixty, when we arrived at the Cape of Good Hope. In the beginning of this fever, inflammatory symptoms chiefly prevailed ; frequently with bilious vomiting ; but, in its progress, it changed into a *typhus* ; or was succeeded by a flux.”

“ The greatest relief seemed to be procured by continued evacuations, with small doses of tartar emetic, or James’s powder. The remissions were so incomplete, and the inflammatory symptoms so prevalent, that bark

was seldom administered till the sixth, or seventh day of the disease."

The journal does not make mention of the result of this practice. But, on the 17th of March, 1772, the case of ——— PILEMAN is recorded. After the exhibition of antimonials, on the 18th, half a dram of bark was prescribed every hour: but, on the following day, it was changed for the saline julep, with half a dram of rhu-barb. On the 21st, the patient being delirious, blisters were applied to the ankles; and an emulsion with camphor was prescribed. On the 22d, an antimonial draught was given: and, on the 23d he died.

Although we are left in the dark concerning the general success of this practice, in this prevalent fever; yet we may conclude, (from what happened to other ships, where similar opinions were entertained by the Surgeons, and similar management adopted,) that the mortality would be considerable. This much is certain, that, in this ship, as well as in many others, whose journals I have perused, with-holding the bark, in contagious fevers, is not one of the least causes of rendering sickness universal.

THE JOURNAL of the EARL SANDWICH commences March 20th, 1772, and ends January 22d, 1774. The diseases, in the beginning of the voyage, venereal infection, and the usual inflammatory complaints.

"GEORGE WALKER was taken ill, about twelve o'clock at night (probably on the 22d of June, 1772,) with delirium, strong, full pulse, and thirst. On the 23d, he was bled to twelve ounces, and took a solution of emetic tartar, by spoonfuls every hour."

"July 24th. The delirium obliged us to lash him down, as five or six men were not able to confine him.

He sweated profusely, more, I believe, from his efforts, than the medicine. Therefore the dose of the solution was increased; and he was again bled to 15 ounces."

" 25th. With the advice of Mr. S——, a blister was applied to his head. Still the most violent symptoms continued or increased. At twelve o'clock a considerable alteration appeared in his countenance; and, at three, he expired."

Twenty cases of fever appear to have terminated fatally: eight deaths happened near Sumatra, in December, 1772; four in January following; and the rest during the voyage. In many cases, a spoonful or two of the decoction of bark are supposed to increase the action of the vessels, which is therefore left off. Great care seems to have been taken in watching for an opportunity of exhibiting the bark, but attending symptoms we are told contraindicated its use.

The Surgeon himself was seized with this fever. The following is the history of his case.

" Dec. 28th, 1772. I was myself very feverish about four o'clock this afternoon. I had eat little for a week past, I found my pulse quick and full, with a throbbing in the temporal arteries, particularly in the left side."

" On the morning of the 29th, I was much the same. I had great lassitude, and disinclination to get up. This I imputed to the tartar emetic, of which I had taken four doses of one grain, last night, at the distance of three hours; after losing eight ounces of blood. I sweated profusely in the night."

" 30th. I found my throat a little sore."

" 31st. I applied *mel Ægyptiacum* to the ulcers, and took the decoction of bark with pleasure, five or six times every hour. But my stomach would not bear it, which

alarmed me much." He then recollected that porter was recommended by an eminent Surgeon to one of his pupils, in a similar situation. "I tried a glassful, and found no ill effects from it. In about an hour I took another glass, which I was astonished had no effect upon my head. I then took a glass of the decoction of bark very well."

"January 1st, 1773. I immediately began with the porter, port wine, and the decoction of bark alternately. I had an amazing spitting, I suppose to the quantity of a quart a day nearly. I applied *mel Ægyptiacum* to clear the sloughs."

"2d. I was astonished that I never found myself giddy, nor that my spirits were raised by drinking two bottles of porter, and one of red wine."

"3d. I thought myself better: continued the porter, wine, and decoction; and, being costive, took half a dram of rhubarb."

"4th. I find myself relaxed and weakly; shall go ashore to-morrow, and get the sick into the hospital at fort Marlborough."

"6th. I continued the decoction of bark twice or thrice a day; and am recovering fast."

All that I have to observe on this case is, that I wish the surgeon, who appears to have been a benevolent man, had sooner personally learned the debilitating effects of a contagious disease; and that a similar cordial regimen had been directed for the men on board of this sickly ship.

THE PRINCESS ROYAL, sailed December 15th, 1772, to Bencoolen and China; and arrived in the Downs the 30th of May, 1774.

Dr. Badenoch, who had the care of this ship, having offered some excellent observations on the fever, which

prevailed on board the NOTTINGHAM, at Johanna *, I expected great pleasure from the perusal of the extracts of his journal †. The following is the first case of fever recorded.

* “During the rage of the Johanna fever, I began the cure with evacuations, &c. in expectation of procuring a plain remission or intermission: but I found myself much deceived; for it assumed the appearance of a continual, with now and then violent exacerbations, under which several sunk. Fearing this might be the fate of the greatest part of those at the same time ill of this fever, I, without further delay, gave between thirty and forty patients in the different stages of that fever, one drachm of the *pulv. cort. peruv.* in wine, or in wine and water; and this to be taken hourly. Several were, at the time of administering this remedy, seemingly within a few hours of their end, with the pulse sunk, and an almost universal coldness of the body, who yet, after a few doses of the bark, were much better, and by continuing it for a day or two, recovered.”

“I observed, that this medicine was so far from preventing natural evacuations, that, on the contrary, it promoted them, especially if evacuations had not been given previous to its administration; and further, that those who took this remedy *earliest*, recovered more perfectly than those who, by evacuations, and the severity of the disease, had suffered much before it was used. Which observation, when joined with this, that recoveries in the torrid zone are slow and uncertain, are strong arguments in favour of the early administration of this medicine. And as for the dose of it, the practical rule of Dr. De Haen, I believe, is, in these fevers, a very proper one, viz. *Neque pondus hic quidquam aut mensura determinat, sed morbi levamen.*” *Medical Obs.* Vol. IV. p. 166.

† Many remarks in this journal being important, I shall present the reader with the following extracts. “The weather being mild, catarrhal complaints were less frequent than usual on first setting out from England, in the winter season.”

“Entering the torrid zone, on the 3d of January, 1773, catarrhal complaints vanished,” and it is added, “that we may soon expect those of another *genus*.”

“Thermometer 67 deg. latitude, 18 deg. 19 min. N.”

“DAVID MORE, Seaman, aged 28, became yellow on the 27th of January, 1773, and vomited much bilious

January 13th. The ship anchored in Praya Bay, on the south end of the island of St. Jago. The thermometer ranged from 72 deg. to 73 deg. which was lower than Dr. Badenoch had ever observed it between the tropics. The ship's company were well supplied with vegetables and fresh provisions; and continued healthy.

“Three Dutch East-India ships, which were then in Praya Bay. had buried from seventy to eighty men each; and had some hundreds sick on board.”

“January 22d, in latitude 9 deg. 15 min. N. the thermometer was at 70 deg. Several were seized with bilious vomiting and purging.”

“On the 31st of March, the Princess Royal anchored at Table Bay, with a healthy ship's company, having no complaints except a few catarrhs; owing to a sudden change of climate from extreme heat.”

“Before we left Table Bay, several Dutch ships arrived; some of which had buried eighty people in the voyage from Holland. None lost less than forty men. I am informed that some of their ships, last year, in a voyage to this place, buried 200 men. An amazing mortality indeed! but owing to the crowding of many people; keeping the ships horribly dirty; and taking double the time to perform this voyage, that the English, and other European ships, generally require.”

“At Fort Marlborough, bilious complaints,” in which is included the remitting fever, “began to make their appearance amongst the ship's crew, about the 18th of June, 1773; and, afterwards, became prevalent. Tartar emetic, or ipecacuanha was given; and, sometimes both were united. The bark, when requisite, was exhibited on the third day.”

“July 4th. The thermometer in the day 85 deg. at night 75 deg. The people who worked in the boats, and slept ashore, at Bencoolen, kept their health full as well, if not better, than those who lived on board, which is not commonly the case in similar situations.”

“July 10th. Bilious complaints are still prevalent, chiefly of the dysenteric kind; and what is not common, in hot climates, catarrhal symptoms are not unfrequent; and, sometimes, are conjoined with the former. The coolness of the nocturnal air, succeeding a hot day, seems to be the efficient cause.”

matter. Pulse not quick. Solution of emetic tartar prescribed."

"August 5th. The predominant disease is dysentery, which appears evidently to be spreading by contagion; which we must endeavour, by every possible means, to prevent."

"Aug. 9th. Although we have had so many dysenteries, yet I have hardly observed one of them to be attended with fever; which is contrary to the general opinion of authors on this subject."

"Aug. 11th. The bilious diseases, having gone through most part of the ship's crew, are now on the decline. Coughs and stuffed lungs are as yet, by no means, gone. Ever since we left Bencoolcu, the great heat of the weather, obliging people to sleep in a current of air, is the cause of their continuance."

"October 10th. Catarrhal and intermitten complaints are better. Only eight upon the sick list."

"Dec. 10th. Left the coast of China for England."

"Dec. 12th. More healthy than any time during the voyage, having only two on the sick list. Our water, filled at Canton, is very indifferent. The transition from cold to hot weather has been very quick. Within forty-eight hours the thermometer has ascended from 57 deg. to 79 deg. Latitude observed 16 deg. 10 S."

The ship arrived in health at the Cape, on the 23d of January, 1774. It is observed that they had been "plentifully supplied with all kinds of provisions. We brought away one hundred live sheep, and twelve carcases, abundance of onions, fruit, and cabbages."

"March 27th. Got thirty large turtles at the Island of Ascension; many of them were above five hundred weight. One is sufficient for our ship's company in one day."

"April 24th. Our people are very healthy: not the least appearance of scurvy, as too generally happens to those ships, who have not touched at the Cape of Good Hope, or Ascension."

"May 8th. Our people very healthy, though we have had a foul wind for fourteen days. Neither scorbutic, nor catarrhal complaints have made their appearance."

"May 29th. For these several days we have been in the English channel. No appearance of the scurvy, although we have been eleven weeks at sea."

“January 28th. Pulse feverish, with constant heat on the skin, and other symptoms of bilious fever. The solution of emetic tartar was continued.”

“29th. Easier. The solution of emetic tartar vomited him; but did not operate downwards. A bolus, with lenitive electuary, and five grains of calcined mercury, was prescribed.”

“30th. Nausea, vomiting, and fever continued; *calor mordens* on the skin. The bolus was repeated.”

“February 2d. The vomit operated briskly, and brought up a great deal of bilious matter: which diminished the oppression on the *præcordia*, raised the pulse, &c. This day however he was very feverish. The solution of emetic tartar was continued.”

“4th. This man has taken two emetics, several doses of the solution with tartar emetic. He is, however, this day, worse than ever; having great weakness and other symptoms which appear very dangerous.”

“5th. The symptoms increased; pulse excessively quick, and weak: anguish, tossing, &c. We endeavoured to give him the bark, but without success. All the symptoms increased, and he expired about eight o'clock in the evening.”

“There appeared no evident signs of putrescency either during the progress, or towards the termination of

“May 30th. This day we arrived in the Downs, after a voyage of seventeen months and nine days.”

“Considering the amount of our ship's company (which has, upon an average, been about one hundred and fifteen during the voyage) and the sickness which usually prevails in the ships, which stay so long on the west coast of Sumatra; the number of those who have died of diseases and accidents are very few. We lost five by diseases, and two by accidents.”

the distemper. I found it impossible to get rid of the load and anxiety of the *præcordia*, although I prescribed emetics and antimonials," the continued use of which, no doubt, increased the disease.

This attentive Physician, notwithstanding he had so successfully departed from the established rules in the fever of Johanna*; yet, at sea†, in a former voyage, and in the beginning of this, acted, in general, very differently. When the patient becomes weak, by the continuance of the fever, and the use of antimonials, we find him indeed flying to the bark, to use his own words, as the "only resource." But no doubt the fatal termination of the case already related, and the narrow escape of another, recorded in the Journal, would induce him, afterwards to give the bark more early. However this may be, no more patients affected with fever died under

* See note, p. 219.

† "For the cure of the bilious fever, most frequent while at sea, bleeding in the beginning, especially in athletic constitutions, was generally necessary; after which, and the use of antimonial medicines, and saline mixtures given in the act of effervescence, the fever soon came to intermit; and then the *cort. peruv.* being administered for a few days, completed the cure. Although this method will, in general, succeed for the cure of this fever while at sea; yet I have observed, that now and then some of these fevers were as violent as those usual in a port; and unless the same method of cure was followed, viz. by giving the bark, without waiting for an intermission, the patient was carried off in a very short time."

"I shall here observe, that whenever these fevers do not proceed with such rapidity as to threaten immediate danger, it is, no doubt, advisable to begin their cure by the use of the preceding remedies; but if, on the contrary, the pulse and strength fails, or the exacerbations become severe, with other symptoms of impending danger, the *cortex peruvianus* is the only medicine to be depended on." *Medical Observations and Inquiries*, Vol. IV. p. 161 and 165.

his care. And, during this unhealthy voyage, he was very successful, having lost only five by diseases, viz. one of a distemper in the chest : one of the fever already mentioned : one of the inflammation of the intestines : one of dysentery : and one of a disease to which no name is given in the extracts before me.

THE Journal of the DUKE OF PORTLAND, commences the 20th of February, 1773, and ends the 18th of June, 1774.

The practice in fevers, after bleeding, consisted in the use of antimonials for four days. During this time the symptoms increased. The bark was then prescribed with its usual success. But the disease being suffered to continue so long, the patients became afterwards liable to the scurvy*.

To some the bark was given more early, and the cure seems to have been more speedy and complete, as happened in the case of the purser ; from August 14th to September the 22d, 1773.

THE KENT to and from Canton, 4th Dec. 1772, to July 16th, 1774. The journal ends April, 1773.

“ JOHN MARK, aged 27, was taken ill with the *bilious* fever on the 2d of February, 1773 ; and had a solution of emetic tartar and manna, which vomited and purged much.”

“ On the 4th of February, a saline mixture was prescribed ; and twenty-five drops of tincture of opium at night. The vomiting and purging still continuing, and the patient's skin being hot and dry, one grain and a half

* Tents were erected for the sick at Java, where they soon recovered from the scurvy. But, it is remarked, August 15th, 1773, that the dysentery became prevalent amongst the ship's company, during the time the vessel remained at that island.

of ipecacuanha, and two grains of opium were given at bed-time."

"On the 8th his pulse being low, weak, and quite small, three spoonfuls of a mixture (composed of one ounce of bark, one dram and a half of snake root, and a pint of port wine) were given every third hour."

"February 9th. Still very low and weak. Pulse frequent and small. Cold sweats."

"10th. Continues his medicines. His only complaint weakness."

"He continued to recover to the 16th of February, when he left off his medicines; and, afterwards, went every day upon deck."

"Feb. 23d. He was taken with a reaching of bile in the night. In the morning, when I saw him, his pulse was very small and quick. He had cold sweats, and constant throwing up of bile."

"A spoonful of a solution of one grain of emetic tartar, and half an ounce of manna, in one ounce of water, was given every hour. Afterwards two spoonfuls of a six-ounce mixture (containing one dram and a half of cordial confection, and thirty drops of tincture of opium) were prescribed every four hours; with an anodyne draught at bed-time."

"Feb. 24th. Pulse quick. Skin very hot. He had vomited several times in the night. His thirst is unconquerable. His skin yellow. The mixture was continued. He died in the evening."

"We left England with a very healthy ship's company. Had only some slight colds, and venereal complaints. We continued healthy, till February 1st, the weather being exceedingly hot with very little wind. At this time, the *bilious* fever made its appearance. In the first

week I had two or three new patients every day; and the disease increased so fast, that the sick list, from the 7th of February to the 20th of March, amounted to fifty and sometimes to sixty daily. Of seventy-five soldiers, only three escaped the distemper. For the first three weeks, it was wholly confined to the soldiers. It afterwards attacked the seamen; of whom one-third were affected. Those who were first seized had the disease in a milder form, than those who had it later: and, what I never observed before, almost every one relapsed, and was nearly as bad as at the first seizure."

"My treatment the second time, was the same as at first, only I gave smaller doses of the medicines as the patients were weaker. I observed almost all those, who had taken large doses of the bark, complained of fixed pains of the right side, greatly affecting their breathing*. As the patients were not in a state to bear bleeding, I applied blisters, at first, which afforded little relief. As I had always found great advantage from calomel in liver complaints, I prescribed it to the quantity of six grains, with a scruple of rhubarb every third day. The first or second dose often gave relief, and I found great advantage from the continued use of it. When the patient could not bear purging, I

* Here an effect is taken for a cause. This seems to be the common error of those gentlemen who have written on the diseases of hot climates; and of many of the Surgeons, who practise on board the East-India ships. Fevers, indeed, when not speedily subdued, in every hot country, especially in unhealthy seasons and situations, very commonly induce infarction of this organ. But it is erroneous to charge the bark as the cause: if it be given early, it will seldom fail in removing the fever, and consequently will prevent its force from falling on this organ. In the fever of Senegal, where not a grain of bark was given, the distemper became contagious and mortal, often ending in fatal obstruction and suppuration of the liver. See Part I. p. 174.

used mercurial ointment; but never with the same advantage, as resulted from calomel."

Those who relapsed were very long in recovering their strength, and I fear would have been much longer, had we not put into the Cape of Good Hope; where we got plenty of all kinds of refreshment. Most of our people had been sick, and were still in a very weakly state, and could not use the ship's provisions. We were only eight days at the Cape. I was on shore most of the time. When I came on board, some of our people who had been very ill, were so much altered for the better, I scarcely knew them.

"Four soldiers were carried off by the fever on board of ship. And one seaman was taken ill at the Cape, and died very suddenly."

In the history of this journal, we still find the great advantage of the bark, though given too late, as much fewer died than in other sickly ships where it was not exhibited.

Great merit is due to the Surgeon of this ship, for the means he used to prevent the scurvy, both in this and in a former voyage. The method he followed shall be taken notice of, in the third part of this work.

THE EXTRACT from the Journal of the TALBOT commences April 25th, 1775, and ends May 7th, 1776. My honoured friend, the late Sir Charles Hudson, was still the commander; and my much respected friend, the late Mr Gandy, chief mate. They were equally distinguished for their humanity and attention to the seamen; who, even in a sick bed, were comparatively happy under their protection.

The greatest praise is also due to Mr. Collie, the Surgeon of the ship, who had the singular satisfaction.

in a voyage of twenty months, of only losing *one* man, and that one, not by any disease of the climate, but by the small-pox.

In the extract from the Journal before me, it is not mentioned to what part of India the ship was bound. But, if I mistake not, she went to Madras and China.

The practice in fevers, after the use of antimonials, consisted in continuing the bark freely. It is added, in the extract from the Journal, “that after the sick began the bark, they recovered in seven days.”

THE JOURNAL of the HAMPSHIRE commences February 23d, 1775, and ends April 20th, 1777.

The Medical practice consisted of bleeding and antimonials in the beginning; and, afterwards, the bark; which, when continued with perseverance, often succeeded.

When an apparent remission encouraged the early and steady exhibition of the bark, all seems to have proceeded prosperously: but when an apprehension of bile in the first passages, or of inflammation suggested the continued use of antimonials, debility was the consequence; and when recourse was had to the bark, in the latter stage of the disease, the cases too generally terminated fatally.

This ship arrived at Fort Marlborough, January 17th, 1776. The Surgeon was there seized with a tertian, which prevented his attendance from the 17th of January, to the first of September.

The OSTERLY East-Indiaman and two country vessels were, at the same time, at Fort Marlborough. It is added, “many gentlemen are dead, and none has escaped a severe fit of sickness.”

Twenty-two cases of fever are mentioned, fifteen of

which terminated fatally: but, in none of those was the bark exhibited till a day or two before death, and then only in decoction.

Six cases terminated fortunately, in which the bark was given in powder early in the disease. One patient, labouring under fever, was sent on shore; but the sequel of the case does not appear. Eight of the deaths happened from the beginning of November, to the end of December 1775; but, the extracts do not ascertain in what latitudes.

The rest of the deaths appear to have taken place whilst the vessel lay at Fort Marlborough.

To guard the inexperienced against the insidious nature of the remittent fever, I cannot forbear mentioning, as it is a common occurrence in hot climates, that one patient, who, for some days, had laboured under mild symptoms, on the 24th of December, 1775, was seized with a violent paroxysm, which proved suddenly fatal. The treatment pursued consisted of a vomit, and afterwards a solution of emetic tartar.

With the same view; and also to shew the danger of temporizing; and delaying the bark, I shall dismiss this Journal with the following history.

“GEORGE MELZIER was taken ill on the 20th of September, 1776. After the use of an emetic, either the saline julep, or a solution of emetic tartar was persisted in to the 24th.”

“On the afternoon of the 24th, he had a remission of the febrile paroxysm, during which some of the decoction of bark was given. The fever again returned in the night with delirium, and great oppression about the *præcordia*. His face looked fuller than usual; and the left eye lid was filled with a serous fluid.”

“Next morning he seemed rather better ; but, as he was talking with one of his mess-mates, he was seized with convulsions, which suddenly carried him off.”

THE JOURNAL of the BUSBRIDGE, to and from Bengal, from May 12th, 1782, to May 19th, 1783.

The antiphlogistic method was at first pursued ; but the Surgeon became sensible of the mistake ; and expressly declares that the bark and wine were the only remedies, together with laxatives, clysters, and diluents ; from which he found any service in the second stage of fevers.

But the exhibition of the bark, it would appear, was still too late, for sickness became very general and the mortality great.

THE JOURNAL of the LASCELLES ; to and from Madras and China, from the 12th of February, 1783, to July, 1784.

This ship was healthy for three months after her departure.

“During our passage to Madras*,” says the Surgeon, “we buried five of the ship’s company ; and fifteen of the soldiers ; and landed the remainder fitter for an hospital than the field.”

The disease which proved fatal was a fever, which became so prevalent, that “fifty of the ship’s company were attacked ; and, of one hundred and fifty-one soldiers, only one escaped the infection. Some relapsed seven times.”

With respect to the treatment, “When the *inflammatory* symptoms were great, an emetic was given in the very beginning ; but during the early part of the voyage

* The extract does not specify at what island the ship touched for refreshment. But, it would seem, that the passage means the run of the vessel from the place of refreshment to Madras.

at least, there were few cases that would admit of this practice without large repeated evacuations."

In this fever, saline medicines and antimonials are said to have been of great service. "The bark, in the low state of the disease, was tried, in a number of cases; but it is said never to have answered the Surgeon's expectation*. "After a crisis had taken place," it is added, "I found the bark an excellent restorative; and have no doubt it was of great use in preventing relapses."

THE YORK, 10 and from China, from the 2d of March, 1783, to the 12th of July, 1784, is represented to have lost very few men. The practice which Mr. Ellis adopted is given in the following extract from the journal. "The remarks which Dr. Clark has made, particularly respecting the remittent fever and the flux, merit the highest attention. Throughout the whole course of the voyage I have followed his mode of treatment, as nearly as possible; and, generally, with the greatest success."

THE EARL SANDWICH performed a voyage to Madras and China, from the 14th of January, 1783, to the 6th of April, 1784.

"Mr. Bruce, the Surgeon of the ship," says the Physician who examined the Journal, "followed the same plan of treatment, as Mr. Ellis, and with the same success."

My correspondent, to whom I am so highly indebted,

* It is not to be wondered that the bark had so little effect at this period of this contagious fever; when the use of every medicine must have been extremely precarious. The same result happened to the late celebrated Sir John Pringle, who never gave it till the last stage of the jail fever. But although his authority, in other respects, is deservedly great, yet no person ought to follow his practice in this disease, for he candidly confessed that, at Ipswich, he lost more than one-fifth of his patients. *Pringle on Diseases of the Army*, 6th Ed. p. 312.

observes, " that the remittent fever was very prevalent and fatal amongst the ships, at Bengal, after the rainy season in 1783 ; except to the OXFORD, which only lost three or four men ; and to the BARWEL, which did not lose so many." After the remittent, an ague was very frequent, in the middle of October ; which usually degenerated into a continued fever, or dysentery ; and in those forms, proved mortal. Several of the sick, ill of these complaints, belonging to the HALSEWEL, were sent to the Hospital at Calcutta. The Surgeon there, attributing the obstinacy of the diseases to viscerai obstructions, prescribed mercury till it salivated, along with the red bark. But the Gentleman who attended the ship, observes, " that this practice was attended with no better success ; for, at the end of six weeks, we had lost four men ; and the recovery of the rest did not appear to be, in any degree, forwarded. When the men returned on board, we saw the pernicious effects of the great quantity of mercury. Those who had undergone a salivation were all seized with fluxes. Of sixteen, thus treated, only four are now alive ; and two of those, who were unable to perform any duty during the homeward voyage, are now in a reduced state."

The judicious Physician, who perused the journals, observes, " that the bark was either not given liberally in the beginning of remittents and intermittents ; or that its use was suspended to make way for antimonials, laxatives, or emetics." Hence we see the necessity for the cautions, which have already been delivered in the second part of this essay*.

The extracts, in my possession, do not ascertain the rate of mortality in the ships, during their stay at Bengal,

* See page 203 et. seq. p.289.

in the sickly season of 1783. But, in the following year, I am informed by Mr. Magennis, that the VALENTINE, of which he was Surgeon; and six other ships stationed at Cogeree, lost, at that place, one hundred and seventy men. "The diseases, which prevailed, were remittents and intermittents, and the dysentery; all generally attended with diseased *viscera*. A few died of remittents; but the principal number of dysentery; which generally attacked those recovering from fevers*."

To proceed farther with the reports of ships individually, in which fevers prevailed either at sea, or in the harbours of India, would only be a repetition of events, which have already been sufficiently exemplified. I shall therefore take leave of this painful part of my subject, with observing, that the reader must not infer, that voyages to India commonly exhibit such dreadful scenes of disease and mortality, as have been presented to his view. On the contrary, when ships set out at a proper season; when they are not too much crowded; when the weather is favourable and no mismanagement happens, fewer lives are lost, in these long voyages, than in the most healthy country villages. And, in perusing the medical journals, I have the peculiar pleasure of finding that many ships have arrived in India, without the loss of a single life by disease†.

* Mr. Magennis revisited Bengal, in the Barrington, in 1789. Eight East-India ships lay that year at *Diamond Point*, which is esteemed much more healthy than any of the former stations in the river Hughley. Forty men were buried at Diamond Point, this year; which, on an average, is only five men to each ship.

† Amongst many instances which might be adduced of the health which ships enjoy in these voyages, I shall only mention to the honour of the officers, and to the attention of Mr. Magennis, "that the VALEN-

In the reports of particular ships, I have concealed the names of the surgeons, where sickness and mortality have been considerable. None wish to be held out, to public view, as the authors of unsuccessful practice. The recording of such events however, although humiliating to the profession, is necessary for its improvement. And if the unsuccessful methods of treating diseases were more generally published, greater advantages would result from them, than from the innumerable histories of successful cases, with which medical publications abound.

Much praise is due to those surgeons, who have been unfortunately stationed in unhealthy ships, for the candour, with which they have recorded the success of their practice: and the care, which some of them have observed in keeping their journals, is an evident proof that they wished mankind to profit by their observations. They, in general, appear to have been ingenious and well-informed men. Several of them suffered sickness, and not a few death in the exercise of their profession. And when disease, like a general conflagration, spreads amongst the crew on board of ships, considering the want of accommodation, of necessary articles of support, of attendance, and, perhaps, even of proper medicines, great mortality must ever be the consequence.

But this is not all: if they failed in preventing the ravages of disease, it was by following the treatment proposed by authors of great eminence. And every one

TINE, in 1784, and the BARRINGTON, in 1789, did not lose a man during the outward passage, although the former was seven months in performing the voyage, and the number of souls on board fell little short of three hundred. In the homeward passage, these ships only lost two men each; all of obstinate dysenteries, which they had contracted before the ships left Bengal."

of them may adopt the words of the candid and ingenious Dr. Schotte, who was still more unfortunate in treating the fever of Senegal, "what can a young practitioner do better, than follow the rules and precepts, laid down by celebrated clinical professors*?"

I cannot conclude this report without offering a few remarks on some improvements, which, it is apprehended, might be made in the medical journals, in the ships in the service of the East-India Company.

At present the journals, which are ordered to be kept, consist of a medical day-book, and another book intended to contain particular cases and observations. These, if regularly executed, would afford much information; but, in the perusal of them, a great deal of time is

* This ingenious Physician acknowledges, that he was prevented from prescribing opium to allay the vomiting in this fever, by the cautions of eminent authors. Clinical authors, he observes, had also interdicted the use of the bark, except in intermissions and remissions of fever. But when too late, at the end of the epidemic, he ventured upon opium and bark. No more were then alive, except three patients. In two the practice succeeded; but it failed in the third. When this unsuccessful case, however, is related, it is no wonder that it should have terminated fatally. The patient "was quite exhausted before I gave him the *laudanum*. It was on the third day of his being taken ill; and after it had put a stop to the vomiting as well as the *singultus*, I gave him the bark. On the fourth and fifth day his body, but particularly his face, began to swell in such a manner, that his eyes became quite closed by it, and the breast turned of a yellow, green and blue colour. He resembled a corpse in the highest degree of putrefaction, in which the air has begun to disengage itself and puff up the skin, a circumstance which I had not observed in any other patient. On the sixth day a *singultus*, or rather a belching, took place again, and he expired on the seventh." *Schotte on the Fever of Senegal in 1778.* See also Part II. p. 109.

unnecessarily wasted ; and they seldom comprehend a full view of the business.

The day-book is divided into columns for entering the names of the sick ; the date of the application ; the symptoms of the disease ; the prescriptions ; and event of the case. If this book were regularly kept, it requires no improvement.

But in the Journal, which is composed from the day-book, much advantage would accrue from executing it in the following manner. Let it contain a short account of the method of treating every disease which occurs, with a few cases in illustration : and also let it comprehend a table of the MONTHLY RETURN of every disease, and a GENERAL RETURN * of all the patients at the end of the voyage.†

By inspecting these tables, any person, at one view, would be enabled to ascertain the rise and progress of diseases during every part of the voyage, and the success of the practice. These tables would be also of the greatest advantage to the surgeon who constructs them, for when much sickness happens, without their assistance, he may long persevere in erroneous modes of treatment, without either detection or suspicion.

* See *Specimens of these Tables*, No. II. and III. in the Appendix.

† In my observations on fevers, &c. published in 1780, I shewed the great advantage which would result from keeping complete and comprehensive tables of MEDICAL RETURNS ; to which the reader is referred. Besides the above tables, others appear to be necessary, particularly the one which contains the diseases, and opposite to each disease the number of males and females affected with it, in the different divisions of life. But on board of ships, the above two tables will be sufficient for giving a view of the sickness and mortality which may happen.

To the Physician, who signs his approbation of the Journals, these tables would be of the highest service. They would shew the comparative sickness and mortality in every ship, and ascertain the most successful modes of treatment.

But these are not the most important advantages which would accrue from the Journals thus managed. At proper periods, a report ought to be published at the expence of the East-India Company (drawn up by their Physician, or by a medical board) and copies presented to each Surgeon in their service. By conducting the business in this manner, ingenious men in the service of the company would be stimulated to offer their observations ; the treatment of diseases would attain to the highest possible perfection ; and consequently an immense number of lives would be saved to the community.

PART III.
OBSERVATIONS
ON THE
MEANS OF PREVENTING
DISEASES
IN
VOYAGES TO THE EAST INDIES.

INTRODUCTION.

IN reviewing the history of our expeditions to the East-Indies, from their first commencement to the present times, we find that they have been occasionally attended with great mortality. The first squadron, which sailed from England, in 1601, for the establishment of the East-India Company, under the command of Admiral Lancaster, consisted of four ships, containing four hundred and eighty men. In less than four months, at sea, and on shore at Saldania, a bay on this side of the Cape of Good Hope, there died of the scurvy and other diseases, one hundred and five men, or nearly one fourth of the whole complement*.

In this early voyage, however, we have the satisfaction of observing the great advantages, which resulted from means of prevention. Three of the ships had so many

* *Purchas's Pilgrim*, Vol. I. *Harris's Collection*, Vol. I. The last author makes the deaths amount to 150, at sea, and on shore at Saldania.

ill, that they could not navigate their respective vessels without the assistance of the merchants, who had embarked to dispose of the adventure; and they were in so weak a condition, that they could not hoist out their boats, when they arrived at Saldania. The Admiral's ship (although it contained near double the number of men of any of the others) continued, at the same time, pretty healthy, owing to his having taken some bottles of lemon-juice on board; of which he gave three spoonfuls to each man, every morning, so long as it lasted.

When we descend to the present times, we find that we have not been more successful than our less experienced ancestors. In the course of this inquiry we have already seen the great mortality which has happened to several ships in the service of the company*, and even to the crew of Captain Cook's ship in his first voyage†.

During the late war, it is also well known that the fleet, under the command of Sir Edward Hughes, in the East-Indies, was so weakened by the scurvy, and other diseases, that, in many of the actions with the enemy, few or none of his ships had a sufficient number of men to work the guns.

The sickness which happened to the 100th regiment; to the 98th; to the 2d battalion of the 42d; and four additional companies, at the island of Johanna, has also been mentioned‡. But the sufferings of these ill-fated troops were great beyond description during their voyage from Saldania, till they arrived at Bombay. Being crowded and ill clothed, a contagious fever, and the scurvy appeared amongst them. The ship's company

* See Page 26, 92, 264, 321, 332 et seq. † P. 91. ‡ P. 27:

also became, in proportion, sickly. The sum of mortality, occasioned by those destructive diseases, is not ascertained; but it must have been very great: for the author of the account, who was an officer of one of the regiments, and an eye-witness of the lamentable catastrophe, says, "that men were thrown over-board by dozens: the mind, soon accustomed to such scenes of distress, became nearly callous to the feelings of humanity; and even the last groans of a brother officer or soldier produced but a feeble paroxysm of grief and subsided with a sigh."

By missing the tract pursued by skilful navigators, instead of landing at Bombay, the fleet was obliged to bear away to the coast of Arabia. Here his majesty's troops divided; and part of them, in the men of war, and in transports, went to Madras. The remainder of the 100th regiment; three companies of the 98th; and the four additional companies arrived at Bombay, after a passage of eleven months and twenty-two days.

Here a continuation of errors still brought on fresh diseases: for by an exertion of military discipline, during the heat of the day, many perished by a *coup de soleil*, and the cholera. The author observes that this singularly unfortunate body was diminished to one-third of their original number, before they saw a shot fired, except the cannonade of the French and English squadrons at Praya Bay*.

The mind shrinks with horror from the relation of such dreadful scenes of human misery; and is still more deeply affected, when it is ascertained, beyond the possibility of a doubt, that by proper attention of the government, which directs such expeditions; and of the

* Remarks upon the causes of diseases amongst new raised troops upon long voyages; 1783.

officers, who are appointed to conduct them, the mortality might be almost entirely prevented.

From what has been advanced in the former parts of this essay it appears, that the diseases to which Europeans are subject in long voyages, and in the various harbours of India, are few in number, and the causes from which they originate extremely limited. It also appears, that whilst one ship is affected with diseases, another, by using proper precautions, is almost totally exempted from ailments. These circumstances afford the strongest proof that sickness is not an inevitable evil, but, in general, the consequence of inattention and mismanagement.

The report from the Journals of the India ships* for fifteen years previous to 1785, evinces the practicability of preventing diseases and mortality in long voyages. And the experience and example of the late Captain Cook ought to convince every commander how much it is in his power, and how much it is his duty to preserve the health of the crew intrusted to his care!

This humane and illustrious navigator, deeply affected with compassion for the death of one-third of his crew at Java, and in his run from thence to the Cape of Good Hope†, began to pay the utmost attention to regulations of health, in his subsequent voyages. In his second expedition to the south seas, in the *RESOLUTION*, with a company of one hundred and eighteen men, he had the singular honour, and satisfaction of performing a voyage of three years and eighteen days, throughout all the climates from fifty-two degrees north, to seventy-one degrees south; with the loss of only one man by sickness. And, after his death, Captain King revisited the same

* Page 315 et seq.

† P. 91.

seas, which had formerly proved so fatal ; and during a voyage of four years and upwards in the *DISCOVERY*, with a company of eighty men, he did not lose a single life by disease*.

The prevention of diseases must always consist either in removing the causes which produce them, or, when this cannot be effected, in counteracting their influence.

In prosecuting this subject, I shall confine myself to a few remarks on the means of obviating the most powerful causes of diseases in voyages to India.

* *Cook's last voyage*, Vol. III.

CHAP. I.

OF THE DIET AT SEA, AND THE MEANS OF COUNTERACTING ITS ILL EFFECTS.

THE provisions with which the East-India ships are supplied, are of the very best quality ; and, with respect to quantity, exceed that in any other service. The daily allowance to each mess, consisting of five men, is eight pounds of salted beef, or seven pounds of pork. Instead of salted meat, stock fish is served twice a week so long as it lasts. The fresh articles, as they are called, consist of three pounds and a half of flour for puddings, or two pints and a half of pease. In the homeward passage rice is commonly allowed instead of biscuit, and yams instead of potatoes.

The other articles are mustard, oil, and vinegar ; and the crew are seldom put to a short allowance of biscuit. Each man is allowed one-fifth of a pint of British spirit in the outward passage ; and arrack in the harbours in India, and in the voyage homewards.

The quantity of salted meat allowed is certainly too much ; and, when other circumstances favourable to the production of the scurvy concur*, is a chief cause of the prevalence of that malady.

The only means of remedying the ill effects of a salted diet is to lessen the quantity, and to substitute other articles of nutriment calculated to counteract, or entirely defeat its baneful influence.

If an adequate quantity of coarse sugar and tea were allowed to the men every day for breakfast, as was proposed in the former edition of this work, the ill effects of a salted diet would be obviated. And this alteration,

* Part II, p. 284.

it is apprehended, might be adopted without any additional expence to the owners; as three-fourths of the salted beef and pork would be sufficient for the voyage.

The health which the crew of an East-India ship commonly enjoys in their return from China to England, is the strongest proof of the advantages, which might be expected from the commutation proposed. The scurvy seldom makes its appearance in a voyage from China; which can be imputed to no other cause, but to the tea and sugar, which every seaman lays in at that port. In other respects the circumstances are the same, and the voyage equally tedious.

But should tea and sugar be thought too expensive in the outward passage, other articles may be substituted. Wheat cleared of its husks, by subjecting it to the same process as barley, will keep sound, in dry casks, for the longest voyage *. A sufficient quantity of this may be boiled with water till it burst; and if it be sweetened with sugar, and one half of the spirit, usually allowed in the morning for drams, be mixed with it, when served out to each mess; it will constitute a pleasant, palatable, and nutritious breakfast. Instead of wheat, rice may be used in the homeward passage.

Wheat and rice are perhaps amongst the cheapest articles of aliment that can be used at sea. They, however, require an extraordinary quantity of water for boiling

* Boiled wheat, when I was in the service, was ordered by some of the Captains to their crew for a meal: and, it appears by the Journals that it has often been given for breakfast in the cold latitudes off the Cape of Good Hope. But so far as I know, it has never been cleared of its husks, which always render it disagreeable. Therefore it is recommended that the wheat should be passed through a barley-mill before it be taken on board.

them. But if every ship be provided with a still, a sufficient quantity of this necessary article may be always distilled from sea water, to answer this purpose, when the ship is at any great distance from a port; or when the water on board becomes scarce.

But of all the correctors of a salted diet, none has been found so powerful as the juice of lemons, and oranges. Therefore as soon as a ship arrives at any island where these fruits abound, a sufficient quantity should be purchased for the company, as their juices will keep during the longest voyage, by mixing with them a proper proportion of spirit *.

That so necessary an antidote against the scurvy may never be neglected, an order ought to be given to every commander to purchase and preserve the juices of these fruits; and to appoint proper officers to see them distributed to the sailors and soldiers in punch, instead of the pernicious drams issued out to them every morning during the voyage.

* One fourth of spirit is sufficient to keep the juice sound; but it will answer equally well when a greater proportion of spirit is added.

The surgeon of the *Kent*, who had been two voyages to India, brought the crews both times home without the least appearance of the scurvy. "In his first voyage, he sailed in company with his Majesty's ship the *PORTLAND*; and eleven *EAST-INDIA SHIPS*. The *PORTLAND* lost men every day, at St. Helena, and in the passage home; and the India ships buried men during the voyages even to the Downs, and up to Gravesend."

The means which this humane surgeon made use of to preserve the health of the crew intrusted to his care, consisted of "thirty-five gallons of lemon juice, and a double quantity of arrack. Of this he made punch, with a due proportion of sugar and water, which was served out instead of drams." By this simple method he preserved his men; when the other ships in the same fleet, had the mortification of losing many.—*Journal of the Kent*, in 1774.

Another method of correcting the influence of salted diet, is to allow to each mess one pound or more of *sour krout* to be eaten with the beef or pork. This article may also be added, with great advantage, to the pease-soup, whilst at sea; and to broths made of fresh meat at St. Helena, or any other station, where vegetables cannot be procured in sufficient quantity for the use of the ship's company *.

Biscuit constitutes a very considerable part of aliment at sea: every method, therefore, should be used to keep it from becoming mouldy, and generating insects: It will be preserved longest sound, if packed in dry casks: and, whenever it is likely to become moist, it should have a cast in the oven.

But as flour keeps longer sound at sea, takes up less room than biscuit, and, when fermented and baked,

* Nothing can afford a stronger proof of the powerful antiscorbutic virtues of *sour krout*, than the following relation from Dr. George Brown, who was Apothecary to his Majesty's Hospitals, last war, in America.

"In the fall, the scurvy began to make its appearance among the regiments that had been longest in America, and, as the cold weather advanced, it attacked the rest of the troops. A variety of medicines were used, most of which mitigated some of the symptoms; but no cure was effected till a quantity of *sour krout* arrived from England, which was given to the scorbutics *ad libitum*, to eat as a sallad with vinegar. At other times it was boiled with their mean; and it was really surprising to see the effect which it had, even in a short time. They devoured it greedily, and recovered apace."

"A great quantity of this useful article arriving, it was issued to the army twice a week, with their salt provisions. And it was as effectual in preventing as it had been in curing that disease; which perhaps is, of all others, the most to be dreaded, in a garrison living on salt provisions, in a cold climate, and subjected to hard duty." *Edinburgh Medical Commentaries*, Vol. IV. p. 137.

counteracts the ill effects of a salted diet, it is much to be wished, that a part of the crew of every ship, in daily rotation, were served with fresh loaves. As every East-Indiaman has a baker on board, if he were exempted from doing the duty of a sailor, and provided with a proper trough, flour, and yeast, a sufficient quantity of bread might be made to answer this purpose. When the yeast *, which is taken from England, becomes deficient, good bread may be made by beating up flour and warm water in equal proportions; and adding to them one eighth or tenth part of porter. After covering them up for some hours, especially if the weather be hot, a fermentation

* The last ingenious author upon the scurvy proposes that yeast should be perserved at sea, in the following manner :

“ Spread a thin layer of yeast on the bottom of a clean tub, or a small cask with one head taken out; turn the bottom upwards, till the yeast dries; then lay another layer, turn the tub in the same manner, and repeat it, till the tub is full of dried yeast.—This will keep good a considerable time.”

“ Another method is by spreading yeast thin on clean boards, exposing it to a moderate degree of heat till its humidity is so far evaporated, that it has a granulated appearance, and feels dry to the touch; it is then to be put into small bottles, or phials which are to be well corked and sealed.”

“ When yeast is wanted for brewing or baking, a pound of molasses may be mixed with a gallon of hot water; and, when it has cooled so as to be blood-warm, or between the 90th and 100th degree of Fahrenheit's thermometer, a little of this preserved yeast is to be mixed with it. Let them be stirred together and kept in a moderate degree of warmth, and a brisk fermentation will ensue, which will produce good yeast.”

“ Honey or sugar may be used instead of molasses; and if a little porter, or stale beer are added, the fermentation will begin sooner.”—See an excellent ESSAY ON THE SCURVY, lately published by Mr. THOMSON, Surgeon in the Royal Navy.

will ensue; and then a sufficient quantity of flour should be kneaded so as to make the whole into light loaves. If a little of the old leaven be kept in the trough, there will not be occasion to add so much porter after the first time.

Sea provisions, in a peculiar manner, require dilution: it is therefore of much importance to take in fresh water at every port; and to use all possible means of restoring its sweetness when it becomes putrid in the course of the voyage.

Various proposals have been made by ingenious men to prevent water from becoming putrid at sea; and also to restore its purity, when it has become offensive by keeping. It has been proposed to add some lime to every cask; and also to impregnate the water with fixed air. The first mode renders the water disagreeable and unfit for culinary purposes; and the latter is too tedious and expensive to become generally useful.

When water becomes putrid, the most simple and easy method of sweetening it, is to expose it to the air in a divided state. For this purpose a very useful machine was invented by Mr. Osbridge, a Lieutenant in the Navy, which has been long adopted in that service. "It consists of a hand-pump, which is inserted in a scuttle at the top of a cask, and by means of it the water, being raised a few feet, falls through several sheets of tin pierced like cullenders, and placed horizontally in a half cylinder of the same metal." By this process the water is exposed to the open air in numberless drops, and the working of the machine is a salutary exercise to the men in fair weather*.

After water is thus sweetened, to render it still more

* Blane on the diseases of seamen.

salutary in counteracting the ill effects of a salted diet, nothing has been found so effectual, as to bring it into a state of fermentation, or, in other words, to brew it into beer. For this purpose, the materials for tartar ale; or porter and sugar*; or essence of spruce and treacle, may be added to a sufficient quantity of water, which will, with very little trouble and at a trifling expence, be converted into brisk palatable small beer.

The tartar ale will be the best drink between the tropics; porter beer, or spruce beer in the colder latitudes.

If the alterations which have been proposed in the aliments and drinks were generally adopted, and steadily pursued, along with other precautions to be afterwards recommended, the scurvy would never make any considerable progress in voyages to India. The seamen and soldiers would generally be landed in full vigour, and consequently would be better enabled to resist the endemic diseases of the country.

But although health would be, in a great measure, secured by adopting the proposed alterations, yet when voyages to so distant a country are protracted by bad weather; or when ships are long detained in their passage through the Straits of Sumatra and Banca, diseases will more or less occur. It therefore remains to point out some articles, which will be required for the support of the sick, and the recovery of convalescents.

During the course of a fever or a flux, the cordials of the medicine chest afford no adequate support. And when the patients are in a convalescent state, with the digestive powers very much impaired, what nutriment will the common provision of the ships afford them? When I was in the service, the sick had nothing else to

* Part II. p. 289.

depend upon, unless the humanity of the Captain allowed them wine and other articles of nourishment from his own table. But this being a very great expence for an individual, such gratuitous support must be always uncertain and precarious.

In the course of my last voyage in the *Talbot*, near thirty dozen of wine were necessarily expended; and it may be affirmed that many of the seamen and soldiers, who otherwise would have fallen sacrifices to disease and weakness, owed their lives to the humanity and generosity of the commander.

If an allowance of wine were settled in the service instead of depending upon the humanity of the commander, the other requisite articles of support for the sick and convalescents may be comprised in a small number, viz. portable soup, salep, sago, sugar, spiceries, and a few of the usual dried fruits.

CHAP. II.

OF THE MEANS OF OBLIATING THE ILL EFFECTS OF HEAT, COLDNESS,
AND MOISTURE OF THE ATMOSPHERE.

HEAT alone, as has been already observed, is seldom productive of much mischief; but it weakens the body, and predisposes it to be more easily acted upon by other causes of sickness. It likewise is a frequent cause of apoplexy, cholera, and diarrhoea; especially when persons work hard, and expose themselves to the rays of the sun.

The best means to guard against the influence of intense heat are, to live temperately; to diminish the quantity of animal food; and to keep the body cool by light clothing.

The direct rays of the sun should be guarded against by stretching an awning over the deck, whilst the men are on board of ship; and by making them wear hats with high crowns when ashore.

When ships come to unload at Bengal, Madras, and other parts of India, the men should not be employed at the tackle in the heat of the day. The price of labour being so trifling, it would always be the safest plan to employ the native sailors of the country on this duty. If this were generally done, and officers careful in preventing the men from overheating themselves when engaged in other necessary work, and afterwards from exposing their bodies speedily to cold air, much sickness might be prevented, and many lives preserved.

Simple moisture is not productive of many diseases, so long as the men can be kept dry, and the ship clean.

But if the weather be at the same time tempestuous, so as to oblige the ports to be shut, the air below becomes stagnant and impure, and diseases are to be dreaded.

The best means of correcting the baneful influence of such a state of the weather, are to keep the ship as pure and clean as possible; to open the scuttles in the ports for the admission of fresh air; to scrape and clean the births daily; to divide the men into three watches, that they may have time to dry their clothes; and, as soon as the storm subsides, to remove the hammocks and chests upon deck; to wash the ship thoroughly; and to dry up all moisture by placing stoves in various parts between the decks.

Cold and moisture, when long continued, never fail to produce the scurvy, except great care be taken to obviate their united influence. Besides the articles of diet already mentioned *, the next method of prevention consists in keeping the body dry and warm with proper clothing.

Every seaman, therefore, when the ship approaches towards the cold latitudes, should be obliged to wear stockings, a flannel waistcoat, and drawers; and when it rains, he should have a cloak, or great coat. If he have not a sufficient change of these necessary articles of apparel, he should be supplied with them, at a moderate rate, out of the slop chest.

The great advantages of clothing are always ascertained beyond a doubt in these long voyages. The petty officer, and even the attentive seaman, possessed of a proper stock of apparel, though living upon the common diet, long resist the scurvy, when those

who are devoid of such necessities, become martyrs to the distemper.

In this chapter, I have forborne pointing out the proper modes of washing and purifying the ship between decks; of admitting fresh air by means of windsails; and of the purifications of the hammocks. The Captains and officers in the East-India ships were so attentive to cleanliness and ventilation, when I was in the service; and, since that period, have made so many improvements, that it would be superfluous to offer farther instructions *.

* So early as the year 1775, it appears, by the Journals, that, in some ships, the decks were regularly washed twice or thrice a week, and the cable tiers, where the soldiers slept, as often swept and fumigated. During mild weather, the gun ports were always kept open, and, in stormy weather, scuttles in the ports for the admission of air.

CHAP. III.

OF DEBILITY IN CONSEQUENCE OF FEVERS, DEJECTION OF SPIRITS, INDOLENCE, AND FATIGUE, CONSIDERED AS CAUSES OF THE SCURVY; AND OF THE MEANS OF PREVENTION.

OF all the causes which pre-dispose to the scurvy, none seems to have greater influence than debility induced by fevers. The accurate Kramer observes* that tedious fevers generally preceded the scurvy, which was so fatal to the Imperial troops in Hungary; and from perusing the medical journals, this seems to have frequently been the case on board the East-India ships.

The best means of obviating this cause of the scurvy are, to abstain from bleeding, the continued use of purgatives, and antimonials which are equally debilitating; to give the bark early and liberally to subdue the fever; and, when the patient is in a convalescent state, to restore his strength by as nutritive a diet as the ship can afford.

The great influence of despondency and dejection of spirits in inducing and aggravating the scurvy, has been sufficiently ascertained by Historians as well as Physicians. The elegant writer of Lord Anson's voyage, in which this malady raged with so much fatality, observes, "That whatever discouraged the seamen, or at any time damped their hopes, never failed to add new vigour to the distemper, for it usually killed those who were in the last stages of it, and confined those to their hammocks, who were before capable of some kind of duty.

* *Dissertatio epistolica de scorbuto.*

So that it seemed as though alacrity and sanguine thoughts were no contemptible preservatives from its fatal malignity."

Officers should therefore carefully prevent every kind of oppression on board of ships. The young and inexperienced frequently meet with ill usage from their self-sufficient messmates: and soldiers are too often wantonly mal-treated by the sailors. I have known so much dejection, despondency, and even disease from these causes, that I could not pass them over in silence.

Low spirits and despondency can only be removed, or alleviated, by exciting the contrary passions of cheerfulness and hope.

The influence of exhilaration of spirits, in relieving the scurvy, is astonishing. Of several instances which might be adduced, I shall only insert the following from Mr. Ives' Journal. "Upon the British fleet coming into the Bay of Hiers," February 1744, "our men understood that the enemy's fleet and ours were soon to engage. There appeared not only in the healthy, but also in the *sick*, the highest marks of satisfaction and pleasure; and these last mended surprizingly daily, insomuch that on the 11th of February, the day we engaged the combined fleets of France and Spain, we had not above four or five, but what were at their fighting quarters."

If joy and cheerfulness remove, for a time, a disease attended with so much dejection and despondency: How much more powerful must they be in obviating the first impression of the distemper!

Indolence is so powerful a promoter of the scurvy that every observer, in long voyages, has noticed its influence. A good officer will therefore guard against this cause by keeping the crew in proper exercise. It often

happens that there is a long vacancy from labour at sea. At such times it would be of great advantage to the health of the crew to encourage them to engage in active diversions. For this purpose fencing and dancing are well calculated, particularly the latter, when accompanied with music, which, along with exercise of body, imparts to the mind pleasure and hilarity.

Fatigue has been esteemed one of the pre-disposing causes of the scurvy. But if the body be kept clean and dry, and due time allowed for sleep, it is to be doubted whether or not the malady would arise from fatigue alone. On board the East-India ships, at least, the scurvy seldom originates from hard labour.

CHAP. IV.

OF THE MEANS OF PREVENTING THE DANGEROUS EFFECTS OF EXHALATIONS FROM THE LAND AT DIFFERENT ISLANDS WHERE THE EAST-INDIA SHIPS TOUCH FOR REFRESHMENT; AND IN SOME OF THE HARBOURS IN ASIA.

THE pernicious influence of exhalations from the land on the health of Europeans at the different islands *; in the Streights of Malacca †, and in some of the harbours in Asia ‡, have been already recorded. It now remains to offer a few remarks on the prevention.

Ships, touching at any of the islands in the outward and the homeward passage for refreshment, should be anchored at as great a distance from swampy shores, marshes, and thick woods, as possible. At St. Jago, Johanna, Mohilla, and other unhealthy islands, the crew should not be suffered to sleep on shore; and every person should be ordered to repair on board before the night-dews descend.

If proper regulations of health have been steadily pursued from the beginning of the voyage, there will be no occasion for pitching a sick-tent. And, if from neglect or mismanagement, the scurvy have become prevalent; it may be easily cured in a harbour, although the sick sleep on board of ship ||.

But if a contagious fever or dysentery have become general, it will then be indispensably necessary to erect sick-tents. A convenient site should be chosen, for this purpose, at a distance from woods, marshes, and the

* Page 26, 27, 90, 93.

† P. 31.

‡ P. 10, 32, 87, 96, 98.

|| Part I. page 8.

oozy banks of rivers; and, if possible, they should be placed on a dry spot, open to the healthful influence of the sea breeze.

A fire, in the night time, should be lighted in every tent. The men should sleep in suspended hammocks, or beds raised at a distance from the ground. Strict discipline should be observed, and no person allowed to roam into the woods at night.

Those who, from necessity, are employed in cutting down wood for the use of the ship, should be supplied with tincture of bark evening and morning. They should not begin to work before the sun has dispersed the fogs; and they should give over labour before the dews fall in the evening.

The company of ships which lie in the river Hughley at Bengal, and at Wampoa in China, suffer much from the effects of fogs and exhalations. Officers should therefore be upon their guard not to allow their men to be exposed to the night air. When necessity obliges them to send any of the seamen, in boats, to Calcutta, or Canton, they should be defended from the chill night-air by proper clothing; and care should be taken, that they do not row their boats near muddy shores, nor anchor them in ill ventilated creeks.

In sailing up the river, from the stations of the ships, to Calcutta and Canton, I have often experienced the temporary ill effects of nocturnal air, even when defended with flannel next the skin, and wrapt up in a warm cloak: and from my feelings, I am certain that, without these precautions, a fever or flux would have succeeded.

It is peculiarly necessary to guard the body against the ill effects of fogs and night air, when ships, in voyages to China, sail near the unwholesome shores of

Sumatra and Java ; or when they anchor at Bencoolen, or Batavia. In these situations half a glass of Huxham's tincture of bark * given to each seaman, evening and morning, will be found a pleasant and excellent preventive.

* Tinctura Corticis Peruviani Composita Ph. Lond.

CHAP. V.

OF THE MEANS OF PREVENTING AND SUBDUING INFECTION.

THE very name of infection formerly spread general panic, and too frequently deprived the sick of that humane attention which their helpless situation demanded. But it is now ascertained that the atmosphere never becomes contagious; and that, in the small-pox *, and even in the plague †, the infectious effluvia, whether issuing from the body of a patient or from substances imbued with matter or miasms, are inert at a very limited distance from their sources.

If the contagious effluvia of the small-pox by dilution with the air become innoxious in less than three feet from an infected patient, and if the propagation of this disease can be prevented by regulations, (which important points have been ascertained by the ingenious and accurate Dr. Haygarth,) every fear concerning fevers, which are of a less infectious nature, will be considerably diminished.

The methods of preventing the introduction of fevers in jails and guard ships have been judiciously treated by Dr. Lind, and Dr. Blane. But they have failed in cautioning the inexperienced against the infectious nature of the remittent fever, and in proposing adequate means for subduing it when the remissions are imperfect.

But this cause of general sickness in our fleets and armies has not escaped the penetrating genius of Dr. Millar ‡: And although the declaration be humiliating to

* See Dr. Haygarth's excellent *Inquiry on the Small-Pox*.

† See Mackenzie, Dawes, Russel, and Howard on the *Plague*.

‡ "The most prevalent acute disease is a fever of the remitting kind, which, though it may sometimes strike fatally at the first attack, gene-

the profession, yet I cannot help joining with him in opinion, that the antiphlogistic method of treatment, and long perseverance in the use of antimonials are not amongst the least causes of rendering fevers contagious and mortal.

To prevent infection from spreading on board of ships, the very first patient seized with fever should be removed to the most airy part of the vessel. Cleanliness and ventilation ought to be carefully attended to; the linen of the patient ought to be frequently changed; and every discharge, issuing from his body, should be received in a bucket with some sea water, which should be instantly covered, and its contents thrown overboard.

But all this will often prove insufficient, unless the bark be given freely and liberally to subdue the fever, or prevent its malignity. Captain Cook, in the fever which appeared in his ship after leaving Batavia*, attended to cleanliness and ventilation. The distemper, however, still increased, and became more malignant. The same means, as appears by the Journals, have been assiduously employed in several of the India ships: but, however necessary these precautions, when the bark was withheld, sickness and mortality too frequently became general.

rally yields to a temperate cordial regimen, and a judicious use of the peruvian bark. When thus treated, though it may sometimes be communicated from the sick to those in health, yet it is quickly terminated, and does not arrive to any high degree of malignity or contagion."

"But when, from a fixed opinion of the general prevalence of inflammation, profuse evacuations have been made, it has become putrid and infectious; and when this infection has been accumulated in jails and hospitals," and in ships, "the highest degree of malignity and contagion has been generated."—*Millar's Observations on the Management of Diseases in the Army and Navy, published 1783.*

CHAP. VI.

OF THE EMBARKATION OF RECRUITS AND TROOPS, AND THE MEANS
OF PRESERVING THEIR HEALTH IN THE VOYAGE, AND ON THEIR
ARRIVAL IN INDIA.

THE recruits sent annually out by the East-India Company are distributed in many ships; and, therefore, are seldom crowded. From inattention, however, to several necessary regulations, they often experience sickness during the voyage.

But the diseases, which have occurred amongst the company's recruits, are trivial when compared with the mortality which has often happened to his Majesty's troops from injudicious arrangement in their embarkation, from mistakes and neglect in the voyage, and from mismanagement on their arrival in India. It therefore appears necessary to offer a few remarks on this subject; which is not only interesting to the cause of humanity, but in which the flourishing state of a great commercial Company, and of even the British Nation is materially involved.

The first circumstance to be attended to in the embarkation of soldiers, is to commence the voyage at a proper time of the year, so that they may be landed at their place of destination in the most healthy season.

Another circumstance of equal importance is not to embark the troops, till such time as the ships are ready to sail. For if troops be sent out in transports, the men suffer from unnecessary confinement: or if they and the recruits be ordered on board the Company's ships before the loading be completed, they not only suffer by confinement, but, having no proper place for their ham-

mocks, are obliged to lie upon chests, or on the cables, in their dirty clothes. By these means they become feverish; and, under the insidious appearance of rheumatism or a cold, contagion is often generated.

As soon as the recruits or soldiers are embarked, besides proper bedding, each man should be furnished with an uniform consisting of a red jacket; two flannel waistcoats; two pair of flannel drawers; two pair of worsted stockings; two pair of ticking trowsers, to buckle at the ankles; two or three shirts; a high-crowned hat; a black stock; and two pair of shoes*.

On their first setting out, their flannel apparel should be worn under their jackets and trowsers; and, when they come into hot weather, the flannel waistcoat, the drawers, and stockings should be laid aside, and carefully preserved clean till the ship enters the colder latitudes off the Cape; when they will again be of great use in preventing the scurvy.

The recruits and troops should be under the command of their own military officers; who should divide them into proper messes under the controul of a sergeant, who should be responsible for their regularity in living; for their clothes; and for the cleanliness of their persons, births and hammocks.

The recruits and soldiers should be employed upon deck in fair weather, in learning some parts of military discipline, or in doing the duty of the ship. But in wet weather, unless on some extraordinary occasions, they should be totally exempted from such duty, as the ill

* See an excellent treatise by an officer, (which has been already quoted, in which the greatest number of these articles are recommended) intitled, *Remarks on the causes of diseases amongst new raised troops, &c.*

effects of moisture will more than counterbalance the advantages which may arise from the exercise.

With respect to the prevention of diseases amongst recruits, and military troops, both at sea and the different islands of refreshment, the officers should cause the same regulations and precautions to be carried into execution, which have already been recommended for securing the health of the ship's company.

When they arrive in India they should at first be quartered in barracks, where it is easy to prevent them from falling into irregularities, and strolling out and exposing themselves to the dangerous effects of night air.

Until they be accustomed to the country, and their health established, field officers should be careful not to fatigue them during the heat of the sun, especially about mid-day. But when they are inured to the climate, they should be gradually brought to bear every hardship, to which they will be afterwards exposed in the exercise of their profession.

CHAP. VII.

OF THE NECESSITY OF RESPONSIBILITY BEING ATTACHED TO THE OFFICES OF COMMANDERS, AS THE MOST CERTAIN MEANS OF PREVENTING THE DISEASES OF SEAMEN AND SOLDIERS IN HOT CLIMATES.

THE prevention of the diseases of seamen and soldiers, as it must always depend upon discipline, becomes, in a peculiar manner, the province of the officers. It is, therefore, much to be wished; as the means of attaining this desirable end are now so well known; that regulations for preserving health were given as *instructions*, to be followed with unremitting perseverance; and not to be left to the *discretion* of officers.

In the service of Government and of the East-India Company every thing seems to be well regulated, and precautions taken against mismanagement, except so far as concern the men. For neglect of duty; waste of stores; the loss of a ship, or of her passage; and for matters of less consequence, a court martial is very justly instituted: but the health of the men, on which the preservation of ships, the fate of battles, nay even the very existence of the nation depend, has never been thought worthy of strict inquiry!

If the commanders of ships, the admirals, generals and officers of our fleets and armies were made responsible for any neglect in carrying proper *regulations of health* into execution; and, should sickness prevail, if an *inquiry* were made to ascertain whether it proceeded from inevitable causes, or from neglect and mismanagement many advantages would accrue. The finances of the nation would not be so unprofitably wasted; and, what

is of more consequence, much human misery would be prevented. Our ships of war would not so often resemble floating funerals; and our naval and military hospitals pest-houses. Our seamen and soldiers, instead of dying almost unpitied in a sick-bed, would add to the honour and aggrandizement of their country.

APPENDIX.

FROM the account which has been already given of diseases as they occur at sea, and in different harbours of India, it will appear how little occasion there is for a numerous catalogue of medicines, and how ridiculous it is to fit up the *medicine-chest* with all the empty show of an Apothecary's shop.

A certain fixed sum being allowed for medicines, no insignificant articles should be admitted; nor such as spoil by the heat and moisture of the climate. Of the former kinds are many of the ointments; the distilled waters; and syrups: of the latter almost all the conserves; electuaries; and confections *.

The greatest part of the tinctures and wines is exceptable, as the articles, on which their virtues depend, may be exhibited in a cheaper and a more certain form.

Among the class of purgatives, many are too drastic for general use; such as the preparations of scammony,

* Of these compositions, it will be proper to admit some of the following into the medicine-chest; viz. conserve of roses; electuary of senna; and aromatic confection; as they are not only convenient for compounding, but for covering the taste of active medicines. If they be made of a thick consistence, and covered with paper, moistened with brandy, they will keep at sea without fermenting or becoming mouldy. Instead of the *Confectio Opiata*, which, when recent, is an excellent medicine, the powder, on which its virtues depend, will keep sound in a bottle well corked during the longest voyage.

colocynth, and aloes. Others do not keep sound for any length of time; such as jalap. A very inconsiderable quantity of these should be therefore carried out, which will make ample allowance for more lenient purgatives, such as Glauber, Epsom, and Rochelle salts; phosphorated soda; crystals of tartar; castor-oil; senna; and rhubarb.

The following is a correct list of the quantity of the principal medicines, which was found barely sufficient for the crew of the Talbot, in her voyage to Madras and China, in 1771 and 1772. But although the allowance was great, when compared with the same articles in many other ships, yet a double or triple quantity of the bark, and some of the other capital remedies, will be indispensably necessary in the more unhealthy voyages to Bengal and Bencoolen.

Peruvian Bark, carefully chosen, in fine powder,	}	40 lb
bottled, corked and sealed - - - - -		
Opium - - - - -		8 oz.
Tincture of Opium - - - - -		2 lb.
Calomel - - - - -		1 lb.
Quicksilver (besides the ointment carried from	}	2 lb.
England) - - - - -		
Glauber's Salt *		28 lb.
Epsom Salt †, in jars - - - - -		28 lb.
Rochelle Salt ‡		4 lb.
Soluble Tartar §		2 lb.
Emetic Tartar ¶		4 oz.
Glass of antimony for making antimonial wine		1 oz.

* Natron Vitriolatum.

† Magnesia Vitriolata.

‡ Natron Tartarisatum.

§ Kali Tartarisatum.

¶ Antimonium Tartarisatum. Ph. Lond.

|| Antimonium Vitrificatum.

Ipecacuanha in powder, bottled, corked and sealed	-	-	-	-	} 3 lb.
Crystals of Tartar ; and Crude Tartar for making Tartar Ale	-	-	-	-	} 1 cwt.
Strong Spirit of Vitriol, for making diluted Vitriolic Acid	-	-	-	-	} 2 lb.
Salt of Tartar *	-	-	-	-	2 lb.
Blistering Plaster	-	-	-	-	3 lb.

The above list is not intended to exhibit all the variety of the medicine chest. Other articles may be required for surgical cases ; and for some diseases which occur sporadically. But if the Surgeon be supplied sufficiently with the above medicines, together with a proper regimen for the sick, he will find it no difficult matter to remove almost every disease, to which Europeans are peculiarly subject in voyages to the East Indies.

Having premised these observations on the medicines, which are judged indispensably necessary in voyages to India, it remains to present the reader with the particular prescriptions ; which, to prevent unnecessary repetitions, were reserved for this place.

No regular arrangement has been observed in the *formulæ medicamentorum*, as it seemed most convenient to number each prescription in the order, in which it first occurred in the second part of this essay.

* Kali præparatum.

FORMULÆ MEDICAMENTORUM.

- No. 1. R. Antimonii tartarisati granum,
Magnesiæ albæ grana undecim ;—misce*.
Capiatur à granis sex ad grana duodecim.
- No. 2. R. Antimonii tartarisati à granis duobus ad
grana quatuor,
Mannæ unciam,
Aquæ puræ bullientis uncias octo ;—misce.
Capiantur unum vel duo cochlearia singulis
semihoris.
- No. 3. R. Antimonii tartarisati grana duo,
Magnesiæ vitriolatæ unciam,
Aquæ puræ bullientis uncias septem,
Succi limonis semiunciam,
Sacchari albi drachmas tres ;—misce.
Capiantur una vel duæ uncie singulis semihoris.
- No. 4. R. Extracti opii grana duo,
Calomelanos grana decem,
Conservæ rosæ quantum satis sit ;—misce,
et forma in pilulas quatuor.
Capiatur una pro re natâ.
- No. 5. R. Tamarindorum unciam,
Aquæ puræ uncias novem :
Coque per sextam horæ partem, et liquori
colato adde
Magnesiæ vitriolatæ unciam cum semisse.
Capiatur partitis vicibus.

* As this powder kept well at sea, one dram of the antimonial preparation and eleven drams of magnesia were rubbed into subtile powder, and preserved for use.

- No. 6. R. Tamarindorum unciam,
Crystallorum tartari scrupulum,
Aquæ puræ uncias duodecim.
Coque per sextam horæ partem, et liquori
ferventi adde
Foliorum sennæ semiunciam,
Mannæ unciam.
Infunde per horas duas, et leniter exprimendo
cola.
Capiatur partitis vicibus.
- No. 7. R. Pulveris corticis peruviani unciam,
Aquæ cinnamomi bullientis uncias decem:
Infunde per horas quatuor; deinde cum ex-
pressionem cola.
Capiantur unciae duæ vel tres singulis semihoris.
- No. 8. R. Amygdalarum dulcium decorticatarum,
Sacchari purificati, singulorum semiunciam;
Benè tritis admisce paulatim
Infusi corticis peruviani (ut suprâ, No. 7.)
uncias duodecim.
Capiantur unciae duæ vel tres, singulis horis,
si ventriculus ferre potest.
- No. 9. R. Pulveris corticis peruviani,
Conservæ rosæ, singulorum unciam,
Aquæ puræ uncias duodecim:
Coque per sextam horæ partem, et liquori
colato adde
Acidi vitriolici diluti drachmam,
Spiritus vini gallici unciam;—misce.
Capiantur unciae duæ frequenter.
- No. 10. R. Pulveris corticis peruviani unciam cum
semisse,
Aquæ puræ uncias quindecim:

Coque lento igne per sextam horæ partem, sub finem injiciens

Gummi arabici drachmas tres :

Liquori calenti adde

Tincturæ corticis peruviani compositæ uncias duas; vel

Tincturæ colombæ uncias duas;—com-misce.

Capiantur uncia duæ vel tres singulis horis.

No. 11. R. Extracti corticis peruviani americani drachmas duas,

Decocti corticis peruviani ferventis Ph. L. uncias undecim; solve, et adde

Tincturæ corticis peruviani compositæ unciam,

Sacchari purificati drachmas sex ;—misce.

Capiantur uncia duæ vel tres singulis sesqui-horis.

No. 12. R. Pulveris corticis peruviani unciam,

Radicis serpentariæ virginianæ drachmas duas,

Aquæ puræ uncias duodecim :

Coque per sextam horæ partem in vase clauso, et ferventi liquori colato adde

Tincturæ corticis peruviani compositæ uncias duas,

Sacchari purificati drachmas sex ;—misce.

Capiantur duæ uncia secundâ quâque horâ, addendo, si perferre possit ventriculus,

Pulveris corticis peruviani à drachmæ di-midio ad drachmam.

No. 13. R. Decocti corticis peruviani uncias decem,

Tincturæ corticis peruviani uncias duas,

Spiritus ammoniæ compositi drachmas tres,
Sacchari purificati semiunciam; adde, pro
re natâ,

Tincturæ opii guttas viginti;—misce.

Capiantur duæ uncix singulis sesquihoris,
addendo, alternis vicibus,

Pulveris corticis peruviani drachmam.

No. 14. R. Decocti corticis peruviani cum serpentariâ,
(ut No. 12.) uncias decem,

Tincturæ lavendulæ semiunciam,

Tincturæ opii guttas viginti;—misce.

Capiantur duæ vel tres uncix, singulis horis.

No. 15. R. Aquæ cinkamomi unciam cum semisse,

Confectionis aromaticæ,

Spiritus ætherei vitriolici, singulorum
drachmam,

Tincturæ opii guttas viginti,

Sacchari purificati drachmam;—misce, ut
fiat haustus.

No. 16. R. Hydrargyri purificati drachmam,

Mucilaginis gummi arabici drachmas duas:

Benè terantur donec globuli visum fugerint, et
adde

Pulv. scillæ exsiccatae drachmæ dimidium,

Pulveris glycyrrhizæ quantum satis sit ut
fiant pilulæ numero sexaginta.

Capiantur quatuor, singulis noctibus, horâ
decubitûs.

No. 17. R. Florum chamæmeli semiunciam,

Kali præparati drachmas duas,

Aquæ bullientis uncias octo: Infunde per
quatuor horas, et cola.

Capiantur duæ vel tres uncix ter de die.

- No. 18. R. Pulveris ipecacuanhæ grana decem,
Antimonii tartarisati grana duo ;—misce.
Capiatur à granis sex ad grana duodecim, singulis horis, donec superveniat vomitus aut catharsis.
- No. 19. R. Decocti tamarindorum ferventis uncias octo,
Antimonii tartarisati à granis duobus ad grana quatuor ;—misce.
Capiatur uncia singulis semihoris.
- No. 20. R. Magnesiae vitriolatæ ab uncia ad unciam cum semisse,
Aquæ ferventis uncias septem,
* Succii limonis semiunciam,
Spiritus vini gallici
Sacchari purificati, singulorum drachmas tres ;—misce.
Capiatur partitis vicibus.
- No. 21. R. Olei ricini unciam cum semisse,
Spiritus vini gallici ; vel
Tincturæ cardamomi compositæ semiunciam ;—misce.
Capiatur partitis vicibus, phialâ prius agitâ.
- No. 22. R. Pulveris ipecacuanhæ à granis octo ad grana duodecim,
Antimonii tartarisati à grano ad grana duo,
Conservæ rosæ quantum satis sit ut fiant pilulæ numero octo.
Capiantur duæ, tertiâ vel quartâ quâque horâ.
* Vel Crystallorum Tartari quantum satis sit.

- No. 23. R. Opii purificati in pulverem triti,
Pulveris ipecacuanhæ, singulorum
drachmam,
Conservæ rosæ quantum satis sit ut fiant
pilulæ numero sexaginta.
Capiantur, pro re natâ, una, duæ, vel tres,
horâ decubitûs.
- No. 24. R. Calomelanos grana decem,
Antimonii tartarisati granum,
Conservæ rosæ quantum satis sit ut fiant
pilulæ duæ.
Capiatur una pro re natâ.
- No. 25. R. Pulveris corticis peruviani unciam,
Cascarillæ semiunciam,
Aquæ puræ libram :
Coque per sextam horæ partem, sub finem
injiciens
Corticis cinnamomi drachmam :
Ferventi liquori colato adde
Gummi arabici drachmas duas,
Tincturæ corticis peruviani uncias duas ;—
miscé.
Capiantur duæ vel tres uncie secundâ quâque
horâ, addendo, pro re natâ, aliquot guttas
tincturæ opii.
- No. 26. R. Amyli triti drachmas sex,
Aquæ puræ libras tres :
Coque ad libras duas ; et adde sub finem coc-
tionis,
Corticis cinnamomi drachmam,
Gummi arabici semiunciam ; cola.
Capiatur pro potu communi.

- No. 27. R. Pulveris colom bæ unciam,
Corticis aurantiorum siccati semiunciam,
Corticis cinnamomi triti drachmas duas,
Spiritus vini gallici uncias duas,
Aquæ bullientis uncias sex :
Macera per quatuor horas, et cola.
Capiantur duæ unciae, bis vel ter de die.
- No. 28. R. Hydrargyri purificati drachmam,
Gummi arabici drachmas tres,
Sacchari albi, drachmam :—
In mortario vitreo conterantur donec hydrargy-
rus visum fugerit ; deinde paulatim ad-
misce
Aquæ puræ,
cinnamomi, singularum uncias quatuor,
Sacchari albi drachmas tres.
Capiantur unum vel duo cochlearia, singulis
noctibus, phialâ priùs agitâtâ.
- No. 29. R. Gummi guaiaci scrupula duo,
Mucilaginis gummi arabici drachmam ;
Benè tritis paulatim admisce
Aquæ puræ unciam,
Pulveris jalapii grana quinque,
Syrupi simplicis drachmam ;—misce.
Fiat haustus alvô astrictâ sumendus.
- No. 30. R. Camphoræ drachmas duas,
Olei olivarum unciam,
Spiritus ammoniæ drachmas duas,
Tincturæ cantharidum drachmas tres ;—
misce.
Fiat linimentum.

TABLE I. A Specimen of the REGISTER FOR TRACING THE PROGRESS OF
FEBRILE INFECTION IN NEWCASTLE.—See Page 111.

No.	Names.	Street.	Date of Admission.	Whence Infected.	Infection communicated to
1	Ralph Symonton	} Behind Castle	1786, September 6	} — — —	} Surtees, No. 4.
2	Robert Symonton		— — — 7		
3	Ann Symonton		— — — 7		
4	Eleanor Surtees	Back Row	— — — 27	Symonton, No. 1.	Donnison, No. 9.
5	Elizabeth Pratt	} St. Nicholas Church Yard	October 9	} — — —	} Ritchie, No. 10, 11, 12, 13.
6	Mary Pratt		— — — 12		
7	Peter Mason		— — — 12		
8	Ann Pratt	} Back Row	— — — 12	} Surtees, No. 4.	Searrow, No. 17.
9	Sarah Donnison		— — — 12		
10	Margaret Ritchie		— — — 16		
11	George Ritchie	} Ditto	— — — 17	} Surtees, No. 4.	} Gill, No. 14.
12	Elizabeth Ritchie		— — — 17		
13	William Ritchie		— — — 22		
14	Isabel Gill	Ditto	— — — 23	Ritchie, No. 10.	Campbell, No. 16.
15	Thomas Sharp	Queen Street	— — — 23	— — —	Cornforth, No. 21.
16	William Campbell	Back Row	— — — 24	Ritchie, No. 10.	Bayne, No. 26.
17	Elizabeth Searrow	Queen Street	— — — 26	Donnison, No. 9.	Slater, No. 32.
	&c. &c.	&c. &c.	&c. &c.	&c. &c.	Hodgson, No. 36.
					Campbell, No. 22.
					Her Daughter, No. 30.
					&c. &c.

T A B L E S.

DISEASES.	179												179												LATITUDES.
	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Cl. I. <i>Febrile Diseases.</i>																									
Remittent Fever	4	3	8	3	8	6		10	7	8	1				2	2	3								
Hepatitis																									
Dysentery																									
&c. &c.																									
Cl. II. <i>Nervous Diseases.</i>																									
Apoplexy																									
Tetanus																									
Colic																									
Cholera																									
&c. &c.																									
Cl. III. <i>Cachectical Diseases.</i>																									
Dropsy																									
Venerical Infection																									
Scurvy																									
&c. &c.																									
Cl. IV. <i>Local Diseases.</i>																									
Suppression of Urine																									
&c. &c.																									
TOTAL.																									
N. 47° 36'	N. 43° 44'	S. 7° 27'	S. 59° 35'	S. 54° 13'	N. 59° 10'	N. 58° 1° 44'	N. 58° 12° 13'	N. 58° 21° 18'	Ma. cro.	Ma. cro.	Ma. cro.	Ma. cro.	N. 18° 8'	S. 6° 56'	S. 26° 13'	S. 25° 22'	N. 25° 27'	N. 27° 0'	Chan. nel.						
44.20.4	41.26.4	26.46	37.15	35.24	3.49	10.58	1.44	12.13	21.18					20.25.17	35.47	13.2	25.27	19.21							

TABLE III. General Return of the Patients on board the Ship —, in a voyage to —, in 179 , and in her return to England, in 179 .—See page 339—340.

DISEASES.	Number	Cured.	Sent to the Hospital.	Died.
<i>CL. I. Febrile Diseases.</i>				
Remittent Fever	65	64	0	1
Intermittent Fever				
Continued Fever				
Hepatitis				
Dysentery				
&c. &c.				
<i>CL. II. Nervous Diseases.</i>				
Apoplexy				
Tetanus				
Cholic				
Cholera				
&c. &c.				
<i>CL. III. Cachectical Diseases.</i>				
Dropsy				
Venereal Infection				
Scurvy				
&c. &c.				
<i>CL. IV. Local Diseases.</i>				
Suppression of Urine				
&c. &c.				
Total				

EXPLANATION OF THE TABLES.

In the first Table, containing a specimen of the register for tracing febrile contagion ; the brace connects the number in a family ill of the fever at one time, and the number to whom the infection has been communicated.

The second Table, intended to comprehend the MONTHLY RETURNS, is formed from the medical day-book *, by placing the number of different diseases respectively in the column allotted for each month. In illustration, the remittent fever is placed in the columns, in the order in which it appeared on board the Talbot. The bottom line is intended to contain the highest and lowest latitude in each month, in the order in which either may occur. This part of the Table is also illustrated by inserting the highest and lowest latitude the Talbot was in during each month.

The third Table comprehending the GENERAL RETURN, is easily formed from the second Table by placing the sum total of each disease, in that Table, in the second column of this ; and in the other columns the manner in which the diseases terminated, or in which the patients were discharged.

* See page 339.

FINIS.

